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*Labor-Union  
Restrictions on  
Innovations in  
Fluid-Milk  
Delivery and  
Their Relationship to  
Market Performance*

JAMES W. GRUEBELE AND LYNN G. SLEIGHT

*Bulletin 751  
Agricultural Experiment Station  
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#### ABSTRACT

Collective bargaining in the fluid-milk industry is a widespread and well-developed institution. In 1969-1971, four-fifths of the fluid-milk volume that was packaged and delivered was handled by unionized workers.

To protect the interests of these workers, labor unions have restricted the use of certain delivery innovations. The ones studied were: (1) dock pickup; (2) warehouse delivery; (3) store-dock (drop) delivery; (4) reduced wholesale delivery; (5) subcontracted wholesale delivery; (6) hourly pay plans for wholesale drivers; (7) reduced frequency of retail delivery; and (8) subcontracted retail delivery.

Restrictions on innovations were expected to have a significant influence on the unit costs of distribution and on the gross margins in the fluid-milk industry. The analysis made in this study showed that the markets with low levels of restriction on innovations had lower unit costs than those with higher restrictions. However, there was no significant relationship between the level of restrictiveness and the gross margins.

One reason turned out to be that while cost benefits are associated with the adoption of delivery innovations, these benefits are relatively small in comparison to the distributor gross margin (DGM). In addition, depending on competitive conditions and the business practices of the firms in a given market, it is possible for these cost savings to be retained as larger profits for the fluid-milk processing firms, the food retailers, or both, rather than being passed on to consumers in the form of lower retail prices. Some union contracts permit innovations as long as the drivers receive higher pay under the innovation, thus capturing some of the benefit for the drivers. Hence, this particular portion of cost benefits realized through delivery innovations is not available for fluid-milk processors to pass on to food retailers, and through them on to consumers.



# LABOR-UNION RESTRICTIONS ON INNOVATIONS IN FLUID-MILK DELIVERY AND THEIR RELATIONSHIP TO MARKET PERFORMANCE

*James W. Gruebele and Lynn G. Sleight*

LABOR CONTRACT PROVISIONS VARY WIDELY, suggesting that the costs per unit of processing and distributing milk may be significantly different under various types of labor-union arrangements. Some of the provisions may restrict the use of innovations or new technology by processors, thereby reducing market performance. Since technology and the adoption of innovations affect labor productivity, they are considered as the key to improved efficiency.

## OBJECTIVES OF THIS STUDY

These were to:

1. Describe collective bargaining and unionization in the fluid-milk industry.
2. Determine the extent of union restriction on innovations by market size and regional location.
3. Analyze the degree to which union restrictions on innovations affect marketing margins and unit costs of distribution.

The information on labor-union restrictions was collected in a sample of seventy-five markets of all sizes, including those with and without state control over the retail prices of fluid milk, under labor contracts effective during all or parts of 1969-1971. Contracts were generally for two or three years. May was the most common renegotiation month, although all months were encountered. Detailed information collected in a subsample of thirty markets showed the proportion of market volume actually handled using selected innovations in 1971.

Since labor constitutes a major cost in the processing and distribution of fluid milk, collective bargaining may be an institutional factor with significant effects on unit costs in operating a fluid-milk processing plant. In a series of studies, labor costs in milk plants ranged from 51.7 to 60 percent of total operating costs [1, 2, 3, 4, 5, 6]. Delivery accounted for over 60 percent of the total outlay for labor in 1956 [7]. Unpublished data from a detailed study of a sample of thirty plants by the Commodity

Economics Division, Economic Research Service, U.S. Department of Agriculture showed labor costs as 48.2 percent of fluid-milk plant processing and delivery costs in 1973.

#### BASES FOR COLLECTIVE BARGAINING

The Railway Labor Act of 1926 is considered as "the first permanent federal guarantee of the right to bargain collectively" [8]. The Wagner Act of 1935 formed the principal basis for the expansion of collective bargaining under legal auspices. The Wagner Act established the right of workers to organize and to elect a representative entity to bargain for them; also, the requirement that the employer must bargain in good faith. Both workers and management must approve the wage determinations before these become official and binding.

Collective bargaining was further developed in the Labor-Management Relations Act of 1947, commonly known as the Taft-Hartley Act, under which unions were given more stringent rules for their conduct in bargaining.

In 1959, the Landrum-Griffin Act amended the Taft-Hartley Act. Some of the controls over union activities were refined, especially internal operations and relations with members.

#### COLLECTIVE BARGAINING IN THE FLUID-MILK INDUSTRY

Collective bargaining in the fluid-milk industry began in 1902 when milk-wagon drivers organized in Chicago and San Francisco. In September, 1902, the Milk Wagon Drivers' Union, Local No. 753 was formed in Chicago. In San Francisco, the Milk Wagon Drivers' Union No. 226 was organized to "rescue our craft from the low level to which it has fallen, and by mutual effort to endeavor to place ourselves on a foundation sufficiently strong to resist further encroachments" [9]. These unions are still actively engaged in representing dairy workers in their respective markets.

#### *Unions Representing Dairy Workers*

The lion's share of worker representation in the fluid-milk industry is by the Teamsters, the largest union in the United States. On a market-volume-weighted basis, over 90 percent of the dairy workers were represented by Teamsters in 1969-1971 (Table 1). The Teamsters Union, the Retail, Wholesale, and Department Store Union, the Brewery Workers Union, and independent unions tend to be found in larger cities.

Since the Teamsters have a major share of the representation of dairy workers, some details on the Teamsters organization may be of interest.

Table 1. — Unions Representing Dairy Workers in 297 Cities, 50 States, and the District of Columbia, 1969-1971

Union affiliation	No. states	No. cities	Pct. cities	Pct. vol. weighted
Teamsters Union .....	48	245	82.5	91.4
District 50, Allied and Technical Workers Retail, Wholesale, and Department Store Union .....	7	27	9.1	4.6
Brewery Workers Union .....	9	19	6.4	9.0
Bakery and Confectionery .....	5	7	2.4	3.7
Butchers Union .....	4	4	1.3	1.4
United Auto Workers .....	2	2	.7	.6
United Steel Workers .....	2	2	.7	.6
Oil, Coke, and Chemical Workers .....	1	1	.3	. <sup>a</sup>
Multi-firm, independent union .....	1	1	.3	.5
Single-firm, independent union .....	1	3	1.0	1.9
No union .....	3	5	1.7	5.0
	4	15	5.1	4.1
Total <sup>b</sup>	51 <sup>c</sup>	297	100.0	100.0

<sup>a</sup> Less than 0.1 percent. <sup>b</sup> Columns add to more than the total because there is more than one union in some cities. <sup>c</sup> Fifty states plus the District of Columbia.

The basic unit in the Teamsters Union is the Local, which is chartered by the Teamster International and receives rights and privileges that are subject to revocation [10]. Teamster Locals retain considerable autonomy. While substantial technical advice and assistance can come to the Locals from higher union echelons, especially from the Dairy Division of the Teamster Conferences, the Locals are not forced to comply with this and are largely free to express and to represent the desires of their own membership. That is especially significant in the dairy industry, since milk handling requires special considerations in comparison with many other products handled by members of general Locals. It is this autonomy that permits such provisions as the limits on wholesale driver volume in Minneapolis [11] to persist, even though Minneapolis is part of the Central Conference of Teamsters and its Master Agreements generally contain no restrictions of this nature.

Between the Local and the International in the Teamster hierarchy are two types of intermediate organizations: the Joint Councils and the Area Conferences. The Joint Councils appear to be playing a diminishing role in bargaining, and are more actively involved in political action [12]. Area Conferences, on the other hand, are becoming more involved with bargaining, particularly in the Central and Western Conferences.

There are four Area Conferences in the Teamster organization (Figure 1). The Western Conference consists of the eleven Western States, Hawaii, Alaska, and the three western provinces in Canada. The Central Conference of Teamsters (CCT) consists of the thirteen Midwestern





A equals United Auto Workers; B, Butchers Union; D, District 50, Allied and Technical Workers; I, single-firm, independent union; K, Bakery and Confectionery Workers; M, multi-firm, independent union; N, nonunion market; O, Oil, Coke, and Chemical Workers; R, Retail, Wholesale, and Department Store Union; S, United Steel Workers; T, Teamsters Union; W, Brewery Workers.

Source: Questionnaires, Northeastern Regional Dairy Marketing Project (NEM-40), 1969, and correspondence by the authors with union officials. Various union locals representing dairy workers, 352 locals, by state and area according to the Teamster Union (Fig. 1)

states from Kansas, Missouri, and Kentucky northward to and including the Canadian provinces of Manitoba and Ontario. The Eastern Conference covers the eastern Canadian provinces and the area along the Atlantic Coast down to and including the Carolinas. The Southern Conference consists of the remaining states, with the exception of the El Paso area of Texas which belongs to the Phoenix Joint Council [13].

The Area Conferences support the Teamster move toward conditions that are more uniform nationwide. The CCT claims to have been especially active in trying to equalize wage rates over its Conference area in the dairy industry [14].

The CCT, through its Dairy Division, is engaged in negotiating fluid-milk labor agreements on an area basis. Much of the area is under Master Agreements made by Dairy Division negotiators, to which the Locals negotiate Addenda. The Master Agreements contain provisions of fairly universal application in the area. The Addenda contain the more specific provisions for an individual market. In this study, 36 of the 75 sample markets were located in the CCT area.

The Western Conference is the oldest and best developed one [15]. It appears to represent nearly all of the dairy workers in its area. Of the 75 markets used in this study, 13 were in the Western Conference.

The Eastern Conference is well-organized, but it has several Locals that are quite possessive about their autonomy; thus, slow to accept area bargaining [16]. Eighteen of the markets used in this study were in the Eastern Conference.

The Southern Conference is the smallest and weakest of the four area groups [17]. Unionization, in general, is weaker in the South. Eight of the 75 markets in this study were located in the Southern Conference.

The importance of Area Conferences in negotiations is being enhanced by changes within the industry. As processing firms become fewer and larger, some Locals lose many of their dairy workers through reductions in the number of plants and in the workers required under new technology. In addition, some of the current plants are located in rural areas, far from the relatively large and prominent Locals of the urban areas. Dairy workers in such rural areas may be regarded by the union as being in a relatively less-favorable bargaining position *vis à vis* the processors. By expanding bargaining at the Conference level, the Teamsters are attempting to improve labor's bargaining position under the changing conditions in the industry.

### *Unionization Patterns*

In the fluid-milk industry, it is common for one union to represent all of the dairy workers in a particular market, both inside (plant) and

outside (delivery) workers. A notable exception is Chicago, where one Teamster Local represents the plant workers and another, the drivers. In Ohio and elsewhere, there are markets in which different unions represent the inside and outside workers of the same firm, but this is the exception rather than the rule. In markets where there is more than one Teamster Local of the same affiliation, coordination among these Locals is often close. In Chicago where two Teamster Locals represent different types of dairy workers, coordination is close enough so that if the drivers' Local should agree to a new distribution system, the plant workers' contract could automatically be reopened to negotiate any matters directly or indirectly related to such a change [18].

#### DELIVERY INNOVATIONS AND CONTRACT PROVISIONS

The following section gives a measure of the extent to which innovations are restricted by contract provisions and the effects of restriction on marketing efficiency.

##### *Delivery Innovations*

Innovations in fluid-milk processing and distribution cover a broad spectrum of changes. Half-gallon, gallon, bulk, paper, and plastic cartons are considered as innovations in packaging. Homogenizing, fortifying and adding vitamins, and making low-fat milk and filled milk are thought of as innovations in the product itself; quantity discounts, secondary labels, private labels, selling through dairy stores, and vertical or contractual integration, as marketing innovations. Reduced frequency of delivery, limited-service delivery, warehouse delivery, dock pickup, sub-contracting delivery through vendors, and the like are innovations in handling methods.

Labor contracts commonly set forth agreements regarding points of actual or potential conflict concerning innovations. Since this study is oriented toward labor agreements and their relationship to efficiency and market performance, the innovations of most interest are those for which concern has been expressed in the form of contractual provisions. Among the sample of contracts reviewed in this study, the packaging, product, and marketing-method innovations just listed have generated few contract provisions aimed at controlling their use. The handling-method innovations, on the other hand, were frequently covered by contract provisions relating to their adoption and use. Thus, delivery innovations were considered to be of more concern than many others, and the study was limited to fluid-milk distribution.

The innovations selected for special study were (1) dock pickup, (2) warehouse delivery, (3) store-dock (drop) delivery, (4) reduced



wholesale delivery, (5) subcontracted wholesale delivery, (6) hourly pay plans for wholesale drivers, (7) reduced frequency of retail delivery, and (8) subcontracted retail delivery. These innovations were selected for study because of the frequency with which they were mentioned in labor contracts, and because there was a variation in the use permitted by labor-union contracts among markets.

The innovations studied are defined as follows:

**Dock pickup** is a system of fluid-milk handling under which wholesale customers take possession of and title to packaged milk at the processor's dock, furnishing their own transportation to their places of business. For example, store, restaurant, and other owners might have their own trucks pick up the milk and deliver it to their establishments. No drivers working for dairy processors are used.

**Warehouse delivery** is a system of wholesale delivery under which the processor's driver delivers milk only to the customer's warehouse(s), rather than to individual outlets. The milk is delivered to retail outlets by the customer's own delivery service. For example, a store or restaurant chain with at least one warehouse takes delivery there from the dairy driver, and then makes further milk distribution to its individual stores or restaurants with its own trucks.

**Store-dock (drop) delivery** is a system of wholesale delivery to stores under which the processor's driver unloads either at the store's receiving dock or directly into its cooler facility. The driver performs no services at the store other than delivery. Cleaning the dairy case, working with the display and arrangement of milk, marking prices, and so forth are not done by the driver, but by store personnel. Drop delivery is common in vertically integrated operations where the store and the dairy are under the same management. Drivers make the milk available at the store, and store personnel handle it from there.

**Reduced wholesale delivery** means cutting the number of days each week for wholesale route operation to five or less. Operating routes six days a week (few markets operate seven days a week any more) when the normal labor week in unionized markets is a five-day week, requires an aggregate driver force sufficient to cover the sixth day. The essence of this innovation is to reduce the delivery week to match the work week of the drivers, thus removing the need for relief drivers or overtime pay for the sixth day.

**Subcontracted wholesale delivery** is a system under which independent drivers (vendors) purchase packaged milk at the processor's dock, furnish their own trucks, and solicit their own wholesale customers. In most cases, the processor has no control over the vendor in any em-

ployer-employee relationship. The vendor is an independent businessman. Vendors may be known as subdealers, independents, bobtailers, and the like in different markets.

**Hourly pay plans for wholesale drivers** makes the driver's pay depend on the time worked, rather than on the number of units handled. "Hourly" may be used to express hourly, daily, weekly, or monthly rates of pay. The contrast is with commission-type pay, which depends wholly or in part on the volume of milk delivered.

**Reduced frequency of retail delivery** represents a reduction of retail home delivery to two deliveries or less per customer per week.

**Subcontracted retail delivery** is a system of retail home delivery under which vendors purchase packaged milk at the processor's dock, furnish their own transportation, and solicit their own retail customers. This is similar to the wholesale subcontract, but at a different level of distribution.

### *Contract Provisions*

The basic data for the following analysis of contract provisions and their use or nonuse of the innovations listed previously were obtained from a sample of 75 unionized markets,<sup>1</sup> representing 54.1 percent of U.S. volume in 1965<sup>2</sup> in 32 states plus the District of Columbia [19]. The list of markets is given in the Appendix.

The 75 markets ranged from the very large metropolitan markets (New York City) to very small ones (Marquette, Michigan). Markets were represented in states both with and without control over the retail and/or wholesale prices of fluid milk.

*Restricted, Not Used* in the following analysis means contract provisions were in effect that prevented the use of an innovation. For example, prior to 1970, less than six-day delivery on wholesale routes in the Chicago market was not permitted.

---

<sup>1</sup> Twenty-five percent or more of market volume handled by unionized firms.

<sup>2</sup> Volume data taken from Raunika *et al.* [19], using their secondary market data for 1965. These volumes reconcile with the official USDA volume figures for the year. The Raunika *et al.* study is perhaps one of the most comprehensive studies of intermarket volumes available. While the absolute levels of volume may be somewhat dated from the 1969-1971 period, the major use made of the volume figures is for the relative size of market comparisons based on volume. These market volumes are considered as far superior to any comparative volume data available or any that the authors could have developed for this use. Where sample markets are identified as only a portion of Raunika's secondary markets, adjustments were made according to population—assuming the per capita levels in Raunika's markets to hold for smaller units used in this study, an assumption implicit in Raunika's data.

*Restricted, Used* means there were limitations in the contract but that an innovation could be adopted by complying with the limiting provisions. For example, one contract specified that warehouse delivery could be used, provided that only drivers who were members of the local dairy union were used. The same contract allowed dock pickup to the extent that it existed as of a particular date, but it could not be expanded [20]. A common restriction is one that permits an innovation to be adopted only if no driver loses his job as a result.

*Not Restricted, Not Used* means there were no restrictions on an innovation, yet it was not used in the market. The reasons included a lack of: (1) interest in the innovation; (2) control by the processor of his product under the innovation; and (3) apparent benefit from the innovation. In one market, store-dock delivery was used by a large grocery chain, but the store personnel were not stocking the dairy cases properly and outdated milk was sold occasionally. After some time, the chain went back to full service by dairy drivers. In some markets, the authors were advised that using warehouse delivery or vendors was undesirable due to the lack of quality control of the milk after it had left the plant dock. Under such circumstances, processors did not want to innovate at the expense of losing control over quality. Under state-controlled pricing, it was common for no discount to be permitted, even if the customer picked up milk at the plant dock. Thus, the retailer had no incentive to adopt dock pickup or warehouse delivery under these conditions.

*Not Restricted, Used* means there was no restriction in the labor-union contract concerning the adoption of an innovation, and it was being used in 1969.

Any innovation, even if not restricted, would not necessarily be used for all fluid-milk volume in a given market. A particular innovation might be adopted by some firms, for example, but not by others. In a supplemental, detailed survey of 30 markets, an attempt was made to determine the proportion of market volume handled under each innovation considered in this study (Table 2).

DOCK PICKUP was used for a weighted average of only 5.6 percent of market volume in the four nonunion markets reporting. In eight unionized markets with no restrictions on the use of this innovation, some volume was being handled by using dock pickup. This ranged from 1 to 15 percent, with an average of 8.3 percent. In eight union markets with partial restrictions on the use of this innovation, only 5.6 percent of the volume was handled through dock pickup. In four of the markets, none of the volume was handled this way; while in the other four, the market volume thus handled was 2 to 10 percent. Nine of the unionized



markets and one nonunionized market did not provide information about dock pickup.

WAREHOUSE DELIVERY was used in three of five nonunion markets for 10.1 percent of the volume, ranging from 5 to 30 percent; but in unionized markets without restrictions on this innovation, only 2 percent of the market volume was handled through warehouse delivery. This was the least-used of all the innovations studied. Eleven unionized markets did not report information about this innovation.

STORE-DOCK DELIVERY was used considerably more than warehouse delivery or dock pickup. Of the five nonunion markets, all but one used this innovation for fluid-milk handling, ranging from 5 to 85 percent among these markets, and averaging 30 percent of the volume. Of the seventeen unionized markets without restrictions on store-dock delivery, it was not used in two small markets and one moderate-sized market; in the rest, it was used for 5 to 90 percent of the market volume, averaging 45.7 percent overall. The higher proportions were generally in moderately large markets. Of the four unionized markets with partial restrictions, all used it for volumes ranging from 4 to 50 percent. Four unionized markets did not report on this innovation.

REDUCED WHOLESALE DELIVERY was the most widely used of the innovations studied. It was employed in five of the nonunion markets. The volumes ranged from 5 to 90 percent, averaging 46.9 percent. The market with 90 percent of the volume moved through reduced wholesale delivery was a moderately large one in the East. Of the sixteen unionized markets without restrictions on reduced delivery, it was used for 20 to 100

Table 2. — Proportions of Fluid-Milk Volume Handled With Selected Delivery Innovations Under Various Conditions of Nonrestriction, 25 Union and 5 Nonunion Markets, 1971

Innovation	Nonunion markets	Union markets	
		Without restriction	With partial restriction
Dock pickup. . . . .	5.6 (4) <sup>a</sup>	8.3 (8) <sup>a</sup>	5.6 (8) <sup>a</sup>
Warehouse delivery. . . . .	10.1 (5)	2.0 (9)	4.2 (5)
Store dock (drop) delivery. . . . .	30.0 (5)	45.7 (17)	29.2 (4)
Reduced wholesale delivery. . . . .	46.9 (5)	91.3 (16)	21.9 (8)
Subcontracted wholesale delivery. . . . .	7.2 (4)	13.5 (4)	13.0 (9)
Hourly pay, wholesale. . . . .	0.0 (2)	79.6 (10)	51.1 (10)
Reduced frequency, retail. . . . .	34.6 (4)	77.0 (14)	50.6 (5)
Subcontracted retail delivery. . . . .	16.6 (4)	13.4 (4)	45.8 (5)

<sup>a</sup> Number of markets reporting. For example, twenty out of thirty markets reported on dock pickup. Data on dock pickup were unavailable for one nonunion market and for nine union markets.

percent of the market volume, averaging 91.3 percent. Nine of the largest markets without restriction used this innovation for 100 percent of the market volume. Of the eight unionized markets with partial restriction, seven used it for volumes ranging from 5 to 100 percent, averaging 21.9 percent overall. The larger proportions were in the smaller markets, rather than in the larger ones. Only one unionized market did not report on this innovation.

SUBCONTRACTED WHOLESALE DELIVERY, as an innovation, was either used to a relatively small extent in each market or not at all, even when not restricted. Of four nonunion markets, two did not use it at all; in the other two, subcontracted wholesale delivery was used for 20 and 15 percent of the market volume. In four unionized markets without restrictions on this innovation, milk was moved this way in all of them. The volumes ranged from 10 to 25 percent, averaging 13.5 percent. Of the nine markets with a partial restriction, all but one used subcontracted wholesale delivery for volumes ranging from 5 to 20 percent. One nonunion market and twelve unionized markets did not report on this innovation.

HOURLY PAY FOR WHOLESALE DRIVERS was not used in two nonunion markets reporting on this innovation (one small and one medium size). Of the ten unionized markets without restrictions on hourly pay, it was not used in only one small market. In the other nine markets, hourly pay was used for volumes ranging from 65 to 100 percent, averaging 79.6 percent. All of these were moderately large markets. Of the ten markets with a partial restriction, nine used it for volumes ranging from 2 to 100 percent, with the larger proportions in moderately large markets. The 79.6-percent proportion in unionized markets without restrictions made hourly pay the second-most-used wholesale innovation, following reduced wholesale delivery (91.3 percent). Data were unavailable about this innovation for three of the nonunion markets and five of the unionized markets in this study.

REDUCED FREQUENCY OF RETAIL DELIVERY was used in all markets in all three categories. In nonunion markets, it was used for volumes of 5 to 65 percent, averaging 34.6 percent. Unionized markets without a restriction on reduced frequency of retail delivery used it for 10 to 100 percent of the milk volume, averaging 77 percent. Most were markets of medium size or larger. Unionized markets with partial restrictions used reduced frequency of retail delivery for 10 to 100 percent of the volume handled, averaging 50.6 percent. The larger proportions were found in moderate-sized markets. Data for this innovation were unavailable from one nonunion market and six unionized ones.

SUBCONTRACTED RETAIL DELIVERY was not used at all in two of the four nonunion markets, and for 10 and 40 percent of the market volume in the other two. Four of the small- to medium-size, union markets with no restrictions on this innovation used it for 10 to 30 percent of their volumes. Of the five unionized markets with partial restrictions, only four used it for volumes ranging from 3 to 90 percent, averaging 45.8 percent. The larger proportions were found in the larger markets. Data for this innovation were unavailable in one nonunion market and sixteen unionized markets.

In most cases, the wider use of innovations that were not restricted occurred in the larger markets.

The fact that nonunion markets did not show full use of the innovations just covered indicates that there are reasons other than union contractual restrictions which keep these innovations from being used.

In markets where the use of the innovations studied was not restricted, the proportions of actual market volumes handled through the use of these innovations indicated the relative importance of each innovation in increasing delivery efficiency from the standpoint of management. Perhaps the most meaningful data are in the center column of Table 2 for unionized markets that did not restrict the innovations. The order of usage from highest to lowest by percentage was: reduced wholesale delivery, 91.3; hourly pay for wholesale drivers, 79.6; reduced frequency of retail delivery, 77; store-dock delivery, 45.7; subcontracted wholesale delivery, 13.5; subcontracted retail delivery, 13.4; dock pickup, 8.3; and warehouse delivery, 2 percent. This relative use pattern should be kept in mind when interpreting the contractual restrictions and the patterns of use shown in Tables 3 through 13.

#### SURVEY OF SEVENTY-FIVE MARKETS

The Northeast Dairy Regional Research Committee (NEM-40) collected data from seventy-five markets. These data pertained in part to labor-union restrictions. Information from that overall survey is summarized in this section. The list of seventy-five markets surveyed is given in the Appendix, grouped into three categories by the volume of milk handled in 1965. The data summarized here represent the contractual conditions governing each innovation, rather than actual use. In other words, the data received from each market indicated whether the use of the innovation was restricted by union contract or whether it could be used by any or some of the processors for some part of their output. The questionnaire did not attempt to determine the percentage of market volume for which any innovation was used. The "percent of volume" in



Tables 3 through 11 relates to the relative market size, as expressed by market volume.

### *Complete Restriction*

The survey of seventy-five markets indicated that in a significant number of them, the delivery innovations were completely restricted. It appears that for most innovations, complete restriction occurred in the larger markets. For example, dock pickup was completely restricted in 29.3 percent of the markets, representing 40 percent of the U.S. by volume. (See column 1, Table 3.) One of the reasons why complete restriction occurs in larger-than-average markets may be that the larger, more powerful unions are located in such markets. A second reason may be that the benefit from some of these innovations tends to be greater in the larger markets; thus, pressure may be greater for adoption, resulting in restrictive contract provisions under stronger unions. If the benefits for a milk dealer from adopting an innovation are small, it is not likely to be adopted; also, the need to restrict such an innovation is correspondingly less. Hourly pay on wholesale routes was restricted in 38.7 percent of the markets, representing 55.3 percent by volume (again, in the larger markets). In these markets, drivers were paid on a commission basis.

**Table 3.—Restriction and Use Status for Six Wholesale and Two Retail Delivery Innovations, 75 Unionized Markets, 1969-1971**

Innovation	Complete restriction (not used)	Partially restricted (used)	Not restricted (used)	Not restricted (not used)	Total
<i>percent of markets</i>					
Dock pickup.....	29.3	14.7	33.3	22.7	100
Warehouse delivery.....	34.6	2.7	36.0	26.7	100
Store-dock delivery.....	25.3	4.0	56.0	14.7	100
Reduced wholesale delivery.....	8.0	8.0	84.0	0	100
Subcontracted wholesale delivery.....	13.3	10.7	52.0	24.0	100
Hourly pay, wholesale.....	38.7	9.3	49.3	2.7	100
Reduced frequency, retail.....	14.7	6.7	70.6	8.0	100
Subcontracted retail delivery.....	12.0	2.7	77.3	8.0	100
<i>percent of volume</i>					
Dock pickup.....	40.0	16.2	26.5	17.3	100
Warehouse delivery.....	42.6	7.3	34.3	15.8	100
Store-dock delivery.....	39.8	5.5	50.4	4.3	100
Reduced wholesale delivery.....	30.7	9.5	59.8	0	100
Subcontracted wholesale delivery.....	7.3	24.4	44.5	23.8	100
Hourly pay, wholesale.....	55.3	8.3	35.9	.5	100
Reduced frequency, retail.....	23.6	6.2	67.6	2.6	100
Subcontracted retail delivery.....	4.6	14.8	76.4	4.2	100

A similar analysis can be made for each innovation, using Table 3. Differences can also be noted between the incidence of restriction among size groups. While hourly pay for wholesale drivers was highly restrictive in the large markets, subcontracted wholesale and retail delivery was not restricted as much in the large markets as in the medium-sized or small ones. (See Appendix Table 1.)

### *Partial Restriction*

Partial restriction means there were limitations in the contract but that an innovation could be adopted under specified conditions. In some markets, for example, dock pickup was allowed to whatever extent it had existed as of a previous date. Under this limitation, dock pickup could not be expanded. Partial restriction of dock pickup was in effect in 14.7 percent of the markets, representing 16.2 percent by volume (column 2, Table 3 and Appendix Table 2). In one case, partial restriction in warehouse delivery meant that it could be adopted as long as no driver lost his job.

Partial restriction in subcontracted delivery was represented by such provisions as: vendors had to join the union; the use of vendors was limited to the extent that it had been used prior to some date; or processors had to provide fringe benefits and other allowances to vendors. These provisions tended to equalize the costs of using vendors with those of using company-employed drivers.

A partial restriction on hourly pay for drivers was represented by contract provisions requiring pay to be the higher of hourly or commission or that hourly pay was permitted only for certain types of wholesale delivery, with commission pay for all other deliveries.

### *No Restriction*

Reduced wholesale delivery had the highest potential for use of any of the innovations studied. Column 3 in Table 3 shows that 84 percent of the unrestricted markets used this innovation. These markets were smaller than average, however, since they represented only 59.8 percent by volume.

Reduced frequency of wholesale delivery provides two kinds of cost savings: (1) higher efficiency by delivering in only five days what would otherwise be delivered in six days; and (2) reduced total wage costs for drivers — fewer relief drivers would be needed since there would be no sixth day of delivery.

A study in the Milwaukee market showed a 7.8-percent reduction in costs due to a change in delivery from six to five days [21]. A similar study in Georgia showed that cost savings were about 6.5 percent [22].

The potential for unrestricted use of subcontracted retail delivery was found in 85.3 percent of the markets (columns 3 plus 4, Table 3), and it was used to some degree in 77.3 percent of the markets (Table 3).

There appears to be a potential for cost savings through the use of vendors in retail delivery. A dairy trade journal reported that a New Jersey firm was discontinuing home delivery routes due to lack of profit; the routes were purchased by independents [23]. Apparently the independents thought they could operate the routes on a profitable basis. A similar incident occurred in the Monterey Peninsula of California, where a major distributor dropped its retail routes and independents were reported to be soliciting the customers on these routes [24].

The potential for unrestricted use of reduced frequency of retail delivery was found in 78.6 percent of the markets (columns 3 and 4, Table 3). This innovation was more prominently used in the medium-size and large markets than in the small ones (Appendix Tables 3 and 4). Table 2 shows this innovation to be the third-most-used one when it was permitted. Previous studies indicate cost savings of 1 to 1.3 cents per quart (17.5 and 28.3 percent of total delivery costs) when home delivery was reduced from three times per week to two [25].

Store-dock delivery had the potential for use in 70.7 percent of the markets (columns 3 plus 4, Table 3). Appendix Table 1 shows that 33 percent of the large-sized markets representing 47 percent by volume were prevented from using this innovation. Store-dock delivery lends itself to larger-sized markets, and probably would be used in such markets if there were no restrictions on its use. Store-dock delivery offers an opportunity to move large quantities of milk in less time than with full-service delivery. Since this innovation has a strong potential for reducing driver jobs, unions apparently make vigorous attempts to restrict its adoption in order to protect drivers' jobs. In an earlier study, chain stores with centralized milk programs often demanded limited-service delivery. Such chains tend to be located in the larger markets [26].

Store-dock delivery, as with dock pickup and warehouse delivery, shifts some of the functions normally performed by full-service dairy drivers to personnel not as highly paid. A 1971 wage comparison of dairy drivers and grocery store workers showed that the drivers received \$3.47 to \$6.03 per hour, while grocery workers received an average of \$4.48 per hour [27, 28]. When in-store functions are shifted from dairy drivers to store personnel, not as many dairy drivers are needed. This results in further savings to processors in total delivery costs.

Subcontracted wholesale delivery had the potential for use in 76 percent of the markets studied, representing 68.3 percent by volume, and



was used to some degree in 52 percent of the unrestricted markets. In 1971 according to Manchester, vendors delivered 13.7 percent of the total U.S. volume, of which 7.4 percent was wholesale and 6.3 percent was retail [29]. In the sample of markets in Table 2, vendors delivered 13.5 percent of actual volume in five unionized markets without restriction, and 13 percent in nine markets with partial restrictions.

The most common reason given for the development and use of vendors is to provide processors with a method of combating rising wages for routemen and other delivery costs. Using vendors enables processors to extend marketing areas and to achieve greater output [30].

Hourly pay had the potential for use in 52 percent of the markets studied, representing 36.4 percent by volume (columns 3 plus 4, Table 3). As mentioned previously, this innovation tended to be more highly restrictive in the larger markets. Unions are usually stronger and more autonomous in some of the larger markets than in the smaller ones. In terms of actual market volume, hourly pay was widely adopted in the markets where it was permitted (Table 2).

Hourly pay as a cost-reducing innovation has been accepted in some areas, but is strongly opposed in others. Chicago drivers are commonly recognized as strong proponents of the commission-pay plan. Other markets have converted to hourly pay, since wholesale drivers may be largely drivers rather than the traditional driver-salesman. Bartlett contends that for most milk now going to a supermarket, the driver does not act as a salesman [31].

One writer expressed the following about the adoption of hourly pay in a major market in which commission pay had been used for a long time: "It is evident that Teamster Locals are beginning to realize the need to give employers relief or face loss of jobs" [32].

The St. Louis market shifted from commission pay to an hourly basis in 1960. According to *Business Week*, 120 St. Louis wholesale milk drivers took pay cuts averaging about \$4,000 to protect the jobs of home-delivery drivers [33]. The basic straight pay was \$7,800 per year on the new hourly basis. The gain to processors under the new contract was probably substantial.

Dock pickup had the potential for unrestricted use in 56 percent of the markets representing 43.8 percent by volume (columns 3 plus 4, Table 3). As with many of the other innovations, the restrictions tended to be greater in the larger markets.

Dock pickup may offer more of a benefit to processors in the larger markets than in the smaller ones. Dock pickup was not used in 37.9 percent of the small markets, even though there were no restrictions on

its use. By comparison, it was not used in only 19 percent of the large markets and 8 percent of the medium-sized ones (Appendix Table 3).

Dock pickup implies that the delivery function is shifted from processor-employed drivers to other types of drivers, largely grocery drivers. Dock pickup would provide a cost advantage in those markets where grocery drivers are paid less than dairy drivers. According to data published by the Bureau of Labor Statistics, dairy drivers in some markets earn higher rates of pay than grocery drivers [34]. In Peoria and in St. Louis, the grocery drivers received 5 percent less than dairy drivers in 1972. Under the dock-pickup arrangement, the driver-pay portion of delivery costs would be lower than when the milk is delivered by company-employed drivers in these markets.

Warehouse delivery had an unrestricted potential for use in 62.7 percent of the markets, representing 50.1 percent by volume (columns 3 plus 4, Table 3). However, as Table 2 shows, only 2 percent of the volume was handled using this innovation in nine unionized markets where it was not restricted. In those markets, apparently, there was little incentive for the industry to adopt this innovation.

Under warehouse delivery, dairy drivers would perform the delivery function between the processor's dock and the chain's warehouse; grocery drivers, between the warehouse and the stores. Under these conditions, dairy products probably would be mixed with other grocery items serviced by the warehouse. The lower rate of pay for grocery drivers would provide a cost savings for that portion of the total delivery costs between the warehouse and the stores, in spite of the fact that another handling would be involved.

#### REGIONAL ANALYSIS OF RESTRICTION AND USE STATUS

The United States was divided into central, eastern, western, and southern areas, as defined by the Teamster Conference Areas shown in Figure 1. The purpose for this part of the analysis was to determine whether there were regional differences in the levels of restrictiveness and use associated with the innovations studied. Some of the differences noted were expected to tie directly to differences between Teamsters Union philosophy or policy at the Conference level, although there was no attempt at verification in this study.

Restrictions on dock pickup were similar in all areas, except the southern one where it was unrestricted (Table 4). On a volume basis, the eastern area was more restrictive than the others.

Like dock pickup, warehouse delivery was not restricted in the southern area (Table 5). The greatest restriction was in the western area.

With store-dock delivery, the southern area had the fewest restrictions (Table 6). In the central and eastern areas, restrictions were prominent in the larger markets. The potential for unrestricted use of this innovation was highest in the southern and central areas.

Restrictions on reduced wholesale delivery were most common in the eastern area (Table 7). Unrestricted use was high relative to the

Table 4. — Dock Pickup, Restriction and Use Status, by Teamster Conference, 75 Unionized Markets, 1969-1971

Restriction and use status	Conference and number of markets			
	Central 36	Eastern 18	Western 13	Southern 8
	<i>percent of markets</i>			
Restricted, not used.....	33.3	33.3	30.8	0
Restricted, used.....	16.7	11.1	15.4	12.5
Not restricted, not used.....	25.0	16.7	23.1	25.0
Not restricted, used.....	25.0	38.9	30.7	62.5
Total.....	100.0	100.0	100.0	100.0
	<i>percent of volume</i>			
Restricted, not used.....	35.0	53.5	36.6	0
Restricted, used.....	19.2	12.0	24.6	11.8
Not restricted, not used.....	26.4	10.0	10.9	11.5
Not restricted, used.....	19.4	24.5	27.9	76.7
Total.....	100.0	100.0	100.0	100.0

SOURCE: NEM-40 Questionnaire, 1969, and interviews by the authors.

Table 5. — Warehouse Delivery, Restriction and Use Status, by Teamster Conference, 75 Unionized Markets, 1969-1971

Restriction and use status	Conference and number of markets			
	Central 36	Eastern 18	Western 13	Southern 8
	<i>percent of markets</i>			
Restricted, not used.....	33.3	33.3	61.5	0
Restricted, used.....	2.8	5.6	0	0
Not restricted, not used.....	25.0	33.3	23.1	25.0
Not restricted, used.....	38.9	27.8	15.4	75.0
Total.....	100.0	100.0	100.0	100.0
	<i>percent of volume</i>			
Restricted, not used.....	47.2	41.6	60.8	0
Restricted, used.....	5.0	12.6	0	0
Not restricted, not used.....	16.1	17.3	10.9	11.5
Not restricted, used.....	31.7	28.5	28.3	88.5
Total.....	100.0	100.0	100.0	100.0

SOURCE: NEM-40 Questionnaire, 1969, and interviews by the authors.



previously mentioned innovations. Reduced wholesale delivery was in use in all markets where there were no restrictions.

Subcontracted wholesale delivery had a relatively low level of restriction (Table 8), except in the southern area where restriction levels were relatively high. In the eastern area, subcontracted wholesale delivery was not being used in many markets, even where it was unrestricted. The reasons are not clear. However, use would not be expected

Table 6. — Store-Dock (Drop) Delivery, Restriction and Use Status, by Teamster Conference, 75 Unionized Markets, 1969-1971

Restriction and use status	Conference and number of markets			
	Central 36	Eastern 18	Western 13	Southern 8
	<i>percent of markets</i>			
Restricted, not used.....	19.4	27.8	46.1	12.5
Restricted, used.....	0	5.6	15.4	0
Not restricted, not used.....	13.9	11.1	15.4	25.0
Not restricted, used.....	66.7	55.5	23.1	62.5
Total.....	100.0	100.0	100.0	100.0
	<i>percent of volume</i>			
Restricted, not used.....	36.6	47.5	46.6	9.4
Restricted, used.....	0	10.6	14.1	0
Not restricted, not used.....	4.0	3.2	4.5	11.5
Not restricted, used.....	59.4	38.7	34.8	79.1
Total.....	100.0	100.0	100.0	100.0

SOURCE: NEM-40 Questionnaire, 1969, and interviews by the authors. "

Table 7. Reduced Wholesale Delivery, Restriction and Use Status, by Teamster Conference, 75 Unionized Markets, 1969-1971

Restriction and use status	Conference and number of markets			
	Central 36	Eastern 18	Western 13	Southern 8
	<i>percent of markets</i>			
Restricted, not used.....	8.3	16.7	0	0
Restricted, used.....	5.6	11.1	7.7	12.5
Not restricted, not used.....	0	0	0	0
Not restricted, used.....	86.1	72.2	92.3	87.5
Total.....	100.0	100.0	100.0	100.0
	<i>percent of volume</i>			
Restricted, not used.....	28.4	45.4	0	0
Restricted, used.....	3.1	17.3	4.8	9.4
Not restricted, not used.....	0	0	0	0
Not restricted, used.....	68.5	37.3	95.2	90.6
Total.....	100.0	100.0	100.0	100.0

SOURCE: NEM-40 Questionnaire, 1969, and interviews by the authors.

Table 8.—Subcontracted Wholesale Delivery, Restriction and Use Status, by Teamster Conference, 75 Unionized Markets, 1969-1971

Restriction and use status	Conference and number of markets			
	Central 36	Eastern 18	Western 13	Southern 8
	<i>percent of markets</i>			
Restricted, not used.....	8.3	11.1	23.1	25.0
Restricted, used.....	11.1	5.6	7.7	25.0
Not restricted, not used.....	16.7	44.4	30.8	0
Not restricted, used.....	63.9	38.9	38.4	50.0
Total.....	100.0	100.0	100.0	100.0
	<i>percent of volume</i>			
Restricted, not used.....	9.9	1.9	16.8	11.5
Restricted, used.....	17.0	31.3	17.2	39.1
Not restricted, not used.....	11.4	44.0	11.6	0
Not restricted, used.....	61.7	22.8	54.4	49.4
Total.....	100.0	100.0	100.0	100.0

SOURCE: NEM-40 Questionnaire, 1969, and interviews by the authors.

where there are a relatively large number of small processors working small wholesale routes serving a large number of small customers. On the basis of previous research, these conditions often exist under state-controlled markets. Of the eighteen sample markets that were state-controlled in this study, eight were in the eastern area, five in the western, three in the southern, and two in the central area.

Hourly pay plans for wholesale drivers were most restricted in southern- and eastern-area markets (Table 9). The western-area markets were less restrictive. Except in the central area, hourly pay was used in all cases where there were no restrictions.

For reduced frequency of retail delivery, restrictions were more prominent in the eastern area than in the others on a volume basis (Table 10). In the western and southern areas, a significant percentage of the markets did not use this innovation, even though there were no restrictions; but in the central and eastern areas, it was commonly used where not restricted. Union control appeared to be the main deterrent to the use of this innovation in the eastern area. In the sample of markets reported in Table 2, 77 percent of the retail market volume was handled through reduced frequency of retail delivery.

Restrictions on subcontracted retail delivery were more prominent in the western and southern areas than in the eastern and central ones (Table 11). The most prominent potential for unrestricted use was in the central area, followed by the western and eastern areas on a volume basis. The lowest potential for unrestricted use was in the southern area.

In summary, there were relatively low levels of restriction in the southern area on all innovations, except hourly pay for wholesale drivers (Table 12). Low levels of restriction were found in the western area on hourly pay and reduced wholesale delivery. There was widespread use of both hourly pay and reduced wholesale delivery in the western area; also, of subcontracted retail delivery in the central area. Hourly pay for wholesale drivers was highly restricted in the eastern area.

Table 9. — Hourly Pay Plans for Wholesale Drivers, Restriction and Use Status, by Teamster Conference, 75 Unionized Markets, 1969-1971

Restriction and use status	Conference and number of markets			
	Central 36	Eastern 18	Western 13	Southern 8
	<i>percent of markets</i>			
Restricted, not used.....	36.1	61.1	7.7	50.0
Restricted, used.....	5.6	11.1	7.7	25.0
Not restricted, not used.....	5.6	0	0	0
Not restricted, used.....	52.7	27.8	84.6	25.0
Total.....	100.0	100.0	100.0	100.0
	<i>percent of volume</i>			
Restricted, not used.....	44.9	76.5	1.7	61.4
Restricted, used.....	11.1	4.0	2.8	21.3
Not restricted, not used.....	1.2	0	0	0
Not restricted, used.....	42.8	19.5	95.5	17.3
Total.....	100.0	100.0	100.0	100.0

SOURCE: NEM-40 Questionnaire, 1969, and interviews by the authors.

Table 10. — Reduced Frequency of Retail Delivery, Restriction and Use Status, by Teamster Conference, 75 Unionized Markets, 1969-1971

Restriction and use status	Conference and number of markets			
	Central 36	Eastern 18	Western 13	Southern 8
	<i>percent of markets</i>			
Restricted, not used.....	11.1	11.1	23.1	25.0
Restricted, used.....	11.1	5.6	0	0
Not restricted, not used.....	5.6	0	23.1	12.5
Not restricted, used.....	72.2	83.3	53.8	62.5
Total.....	100.0	100.0	100.0	100.0
	<i>percent of volume</i>			
Restricted, not used.....	8.0	43.9	16.8	11.5
Restricted, used.....	13.0	1.4	0	0
Not restricted, not used.....	2.3	0	10.4	9.4
Not restricted, used.....	76.7	54.7	72.8	79.1
Total.....	100.0	100.0	100.0	100.0

SOURCE: NEM-40 Questionnaire, 1969, and interviews by the authors.



Table 11.—Subcontracted Retail Delivery, Restriction and Use Status, by Teamster Conference, 75 Unionized Markets, 1969-1971

Restriction and use status	Conference and number of markets			
	Central 36	Eastern 18	Western 13	Southern 8
	<i>percent of markets</i>			
Restricted, not used.....	5.6	11.1	23.1	25.0
Restricted, used.....	0	5.6	0	12.5
Not restricted, not used.....	8.3	0	15.4	12.5
Not restricted, used.....	86.1	83.3	61.5	50.0
Total.....	100.0	100.0	100.0	100.0
	<i>percent of volume</i>			
Restricted, not used.....	3.5	1.9	16.8	11.5
Restricted, used.....	0	31.3	0	29.7
Not restricted, not used.....	6.8	0	6.4	9.4
Not restricted, used.....	89.7	66.8	76.8	49.4
Total.....	100.0	100.0	100.0	100.0

SOURCE: NEM-40 Questionnaire, 1969, and interviews by the authors.

Table 12.—Percentage of Markets in Each Teamster Conference Having Complete and No Restrictions on the Use of Six Wholesale and Two Retail Delivery Innovations, 75 Unionized Markets, 1969-1971

Innovation	Conference and number of markets			
	Central 36	Eastern 18	Western 13	Southern 8
	<i>complete restriction<sup>a</sup></i>			
Dock pickup.....	33.3	33.3	30.8	0
Warehouse delivery.....	33.3	33.3	61.5	0
Store-dock delivery.....	19.4	27.8	46.1	12.5
Reduced wholesale delivery.....	8.3	16.7	0	0
Subcontracted wholesale delivery.....	8.3	11.1	23.1	25.0
Hourly pay plans, wholesale.....	36.1	61.1	7.7	50.0
Reduced frequency, retail.....	11.1	11.1	23.1	25.0
Subcontracted retail delivery.....	5.6	11.1	23.1	25.0
	<i>no restriction<sup>b, c</sup></i>			
Dock pickup.....	50.0	55.6	53.8	87.5
Warehouse delivery.....	63.9	61.1	38.5	100.0
Store-dock delivery.....	80.6	66.6	38.5	87.5
Reduced wholesale delivery.....	86.1	72.2	92.3	87.5
Subcontracted wholesale delivery.....	80.6	83.3	69.2	50.0
Hourly pay plans, wholesale.....	58.3	27.8	84.6	25.0
Reduced frequency, retail.....	77.8	83.3	76.9	75.0
Subcontracted retail delivery.....	94.4	83.3	76.9	62.5

<sup>a</sup> Restricted, not used status in Tables 4-11. <sup>b</sup> Not restricted, not used plus not restricted used status in Tables 4-11. <sup>c</sup> The restricted, used status (partial restriction) in Tables 4-11 does not appear in this table.

On a volume basis (Table 13), the central area was lowest in restrictions on one of the innovations and highest on none; the eastern area was lowest on two innovations and highest on five; the western area was lowest on two innovations and highest on three; and the southern area was lowest on four and highest on none. The eastern area, thus, was the most restrictive one, and the southern area the least restrictive overall.

In comparing levels of restriction among innovations, both by size of market and by area, the results appear to correlate well with expectations. Hourly pay for wholesale drivers is probably the most controversial innovation, particularly with the rapid technological advances that allow more product to be handled per unit of time or per route. The drivers are reluctant to give up commissions. The processors may prefer hourly pay plans, since these would appear to reduce delivery costs. Because of the impasse, union restrictions often impede or even prevent the adoption of various cost-reducing delivery innovations.

Store-dock delivery and reduced wholesale delivery offer opportunities to reduce delivery costs, but also to openly reduce the number of jobs. Drivers may view restrictions on these innovations as necessary.

Table 13. — Percentage of Volume in Each Teamster Conference Represented by Markets Having Complete Restriction and No Restriction on the Use of Six Wholesale and Two Retail Delivery Innovations, 75 Unionized Markets, 1969-1971

Innovation	Conference and number of markets			
	Central 36	Eastern 18	Western 13	Southern 8
<i>complete restriction<sup>a</sup></i>				
Dock pickup.....	35.0	53.5	36.6	0
Warehouse delivery.....	47.2	41.6	60.8	0
Store-dock delivery.....	36.6	47.5	46.6	9.4
Reduced wholesale delivery.....	28.4	45.4	0	0
Subcontracted wholesale delivery.....	9.9	1.9	16.8	11.5
Hourly pay plans, wholesale.....	44.9	76.5	1.7	61.4
Reduced frequency, retail.....	8.0	43.9	16.8	11.5
Subcontracted retail delivery.....	3.5	1.9	16.8	11.5
<i>no restriction<sup>b, c</sup></i>				
Dock pickup.....	45.8	34.5	38.8	88.2
Warehouse delivery.....	47.8	45.8	39.2	100.0
Store-dock delivery.....	63.4	41.9	39.3	90.6
Reduced wholesale delivery.....	68.5	37.3	95.2	90.6
Subcontracted wholesale delivery.....	73.1	66.8	66.0	49.4
Hourly pay plans, wholesale.....	44.0	19.5	95.5	17.3
Reduced frequency, retail.....	79.0	54.7	83.2	88.5
Subcontracted retail delivery.....	96.5	66.8	83.2	58.8

<sup>a</sup> Restricted, not used status in Tables 4-11. <sup>b</sup> Not restricted, not used plus not restricted, used status in Tables 4-11. <sup>c</sup> The restricted, used status (partial restriction) in Tables 4-11 does not appear in this table.

Dock pickup and warehouse delivery may be less obvious as potentially harmful to jobs, since they tend to be applicable only where dairy customers are capable of assuming the delivery function. One would expect lower levels of restriction on these innovations.

Retail routes now represent only about 19 percent of the total volume [35]. The trend toward more store sales means unions and drivers cannot impose strong restrictions on retail delivery without risking a loss of jobs. Thus, a relatively low level of restriction on retail innovations would be expected.

Subcontracting wholesale delivery has been well established in such markets as Chicago, Detroit, and Buffalo where 19, 38, and 33 percent of the wholesale routes, respectively, were vendor-owned in 1968 [36]. Restriction would be expected to be based on such diverse factors as past market practices, local customs, perhaps municipal regulations, or other local factors. Relatively little restriction on subcontracting wholesale delivery would be expected.

The weaker unionization of the southern area would be likely to result in fewer restrictions. This was the case. Of the relatively autonomous Teamster Locals in the eastern area, those strong enough to resist Teamster trends toward area bargaining would be expected to accomplish a greater degree of restrictiveness than Locals in other areas where such bargaining is common. If union autonomy is a feature of union strength (as in the eastern area) and if a generally low level of unionization is a feature of union weakness (as in the southern area), the general level of restrictions on innovations could be lower where unions are weaker and higher where they are stronger.

#### CONTRACT RESTRICTIONS AND PERFORMANCE

One of the hypotheses of this study was that restrictive labor contract provisions are associated with lower levels of market performance. Performance in this study was measured in two ways: (1) distributor gross margins and (2) costs of delivery labor per unit.

##### *The Distributor Gross Margin*

The term "distributor gross margin" (DGM) is defined here as the difference between the lowest reported store price for whole milk in a market and the Class I price paid to producers, as shown in the monthly Fluid Milk and Cream Report. The DGM represents the total cost of marketing, including the costs and profits for handling milk for processors and retailers. Bain and others have included margins (the excess of price over the average cost) as a dimension of market performance [37].



However, such detailed data for the dairy industry were not available. Bartlett has stated that for all its imperfections, DGM "appears to be the best yardstick available for comparing the distribution efficiency of markets within a given year" [38].

In calculating DGMs for this study, price data were used for April, May, and June of 1969.

### *Unit Cost of Delivery Labor*

The second measure of performance used was the unit cost of delivery labor, as determined from contractual agreements on wholesale drivers' pay for a sample of twelve markets on which detailed analysis was possible. The basic contractual agreement defined the employment terms and conditions for drivers, which were translated into a cost function for labor including basic salary, commissions, and negotiated fringe benefits.

The route volume figures used were the best available information from the sample markets, standardized to five-day weeks, four-week months, and eight-hour days. Although some firms may not have been operating on this type of schedule, that did not harm the analysis.

## ANALYSIS OF DISTRIBUTOR GROSS MARGINS

### *Comparisons Among Teamster Conference Areas*

Sample markets in four Teamster Conference areas had average DGMs as follows: southern, 27.5 cents per half-gallon; western, 27.2; eastern, 23.3; and central 21.9 cents per half-gallon. The differences in the DGMs were statistically significant with two exceptions: between the central and eastern area, and between the southern and western area (Table 14). The highest DGM was found in the southern area, even though that is the least-unionized one in the United States.

Using Spearman's rank correlation [39], no significant difference was found in the rankings in Table 15 when correlating the rankings of restriction with those of size for the DGM. This means that the rank of DGMs among areas appears to be unrelated to the level of restrictiveness on innovations in these areas. This fails to reject the hypothesis that the DGMs are the same in all markets, regardless of the degree of restriction. In other words, evidence did not support the alternative hypothesis that DGMs are higher in the markets with the higher levels of restrictiveness. (See Table 15.) The relatively low restrictiveness in the southern area contrasts with the fact it had the highest average DGM, also tending to refute the hypothesis. The eastern area had the second-lowest average DGM, but was highly restrictive.

To more accurately determine the relationships between size of market and DGM, each DGM was weighted by its individual market volume to determine a weighted DGM for each area. In the central and southern areas, the weighted DGM was not much different than the simple-average DGM. In the eastern and western areas, however, the weighted-average DGM was 2.5 cents per half-gallon lower than the simple-average DGM. In these areas, therefore, the larger markets had lower DGMs than the smaller ones.

Table 14. — Comparison of Differences, Mean Distributor Gross Margins, Teamster Conferences, 75 Unionized Markets, April-June, 1969<sup>a, b</sup>

Pairs of conferences	Differences in the DGM, cents per half gallon	Degrees of freedom	Calculated <i>t</i> value	Significance level and table value of <i>t</i> at that level	
Central-Eastern.....	1.4	52	0.99	NS <sup>c</sup>	...
Central-Western.....	5.3	47	3.35	1%	2.69
Central-Southern.....	5.6	42	3.01	1%	2.70
Eastern-Western.....	3.9	29	2.38	5%	2.04
Eastern-Southern.....	4.2	14	2.39	5%	2.06
Southern-Western.....	0.3	19	0.17	NS <sup>c</sup>	

<sup>a</sup> USDA, Fluid Milk and Cream Report, Stat. Rpt. Serv., April, May, June, 1969. <sup>b</sup> For the procedures used, see Snedecor, G.W., and W.G. Cochran, 1967. *Statistical Methods* (6th ed.) Ames, Ia. Iowa State Univ. Press. P. 105. <sup>c</sup> Not significant at the 95-percent level of confidence.

Table 15. — Rank Comparisons, Distributor Gross Margins and Complete Restriction and Innovations, by Teamster Conference Area, 75 Unionized Markets, 1969-1971

	Teamster Conference			
	Central	Eastern	Western	Southern
	<i>ranking, low to high</i>			
Distributor Gross Margins <sup>a</sup> .....	1	2	3	4
Restrictions on: <sup>b</sup>				
Dock pickup.....	2	4	3	1
Warehouse delivery.....	3	2	4	1
Store-dock delivery.....	2	4	3	1
Reduced wholesale delivery.....	2	3	1 <sup>c</sup>	1 <sup>c</sup>
Subcontracted wholesale delivery.....	2	1	4	3
Hourly pay, wholesale delivery.....	2	4	1	3
Reduced frequency, retail.....	1	4	3	2
Subcontracted retail delivery.....	2	1	4	3
	<i>number</i>			
Lowest rankings.....	1	2	2	4
Highest rankings.....	0	5	3	0

<sup>a</sup> Rankings based on the average DGM in each area, given in text section under Comparisons Between Teamster Conference Areas. <sup>b</sup> Rankings for innovations derived from the percentages given in Table 13. <sup>c</sup> For reduced wholesale delivery, the level of restrictions was identical for the Western and Southern Conference areas.

If larger markets are assumed to have more-powerful unions capable of exerting their bargaining power so that margins are increased along with delivery costs, the results would suggest rejecting this idea for the eastern and western areas.

### *Dairy Stores, Supermarket-Captive Plant Operations, and State-Controlled Markets*

Among the factors commonly thought to have important effects on efficiency and margins in a market are the presence of: (1) dairy stores such as Lawson's, Cumberland Farms Dairy, Becker Milk Company, Garden State Farms, High's Dairy in Washington, D.C., and Farmbest Stores; and (2) supermarkets with captive processing plants. Further information is given in publications by Bartlett, Gruebele, and others [40, 41, 42, 43, 44, 45]. Previous studies have revealed that marketing margins are affected in markets where there is state control of retail prices [46, 47, 48].

### *Regression Analysis of Union Restrictions*

A regression model was used to analyze the relationship between the DGM and the level of union restrictiveness. Captive dairy stores, supermarkets with captive processing plants, and state control of wholesale and retail prices were included in order to appropriately specify the model.

Each wholesale innovation was treated individually in a regression model on two levels of restriction. Those two levels were compared to no restriction. The basic model was:

$Y = a + b_1 X_1 + b_2 X_2 + \dots + bZ$ , where  $Y$  is DGM in cents per half-gallon;  $a$  is the intercept:

$b_1$  and  $b_2$  are regression coefficients of dummy variables  $X_1$  and  $X_2$ ; and

$b$  is the regression coefficient of the continuous variable  $Z$ .

The variables used in the regression were:

$X_1 = 1$  in markets with state control; 0 otherwise.

$X_2 = 1$  when dock pickup was restricted at the 4 level; 0 otherwise.<sup>3</sup>

$X_3 = 1$  when dock pickup was restricted at the 3 level, 0 otherwise.

$X_4 = 1$  when warehouse delivery was restricted at the 4 level, 0 otherwise.

$X_5 = 1$  when warehouse delivery was restricted at the 3 level, 0 otherwise.

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<sup>3</sup> The 4 level was a complete restriction; the 3 level, partial restriction.



$X_6 = 1$  when store-dock delivery was restricted at the 4 level, 0 otherwise.

$X_7 = 1$  when store-dock delivery was restricted at the 3 level, 0 otherwise.

$X_8 = 1$  when reduced delivery was restricted at the 4 level, 0 otherwise.

$X_9 = 1$  when reduced delivery was restricted at the 3 level, 0 otherwise.

$X_{10} = 1$  when subcontracted wholesale delivery was restricted at the 4 level, 0 otherwise.

$X_{11} = 1$  when subcontracted wholesale delivery was restricted at the 3 level, 0 otherwise.

$X_{12} = 1$  when hourly pay plans were restricted at the 4 level, 0 otherwise.

$X_{13} = 1$  when hourly pay plans were restricted at the 3 level, 0 otherwise.

$X_{14} =$  Market size expressed in millions of pounds of milk.

$X_{15} = 1$  when no dairy stores were in the market, 0 otherwise.

$X_{16} = 1$  when no integrated supermarket operations were in the market, 0 otherwise.

$X_{17} =$  Dependent variable, DGM, in cents per half-gallon. (Y)

The results of the regression were as follows:

$$\begin{aligned}
 Y = & 22.96 + 3.98 X_1^* - 1.53 X_2 - .76 X_3 - .34 X_4 \\
 & \quad (1.47) \quad (1.56) \quad (1.91) \quad (1.60) \\
 & - 1.82 X_5 + 2.49 X_6 - 1.87 X_7 - 5.84 X_8 - 2.28 X_9 \\
 & \quad (3.75) \quad (1.69) \quad (3.22) \quad (2.99) \quad (2.29) \\
 & - .56 X_{10} - 1.10 X_{11} + 2.34 X_{12} + 3.28 X_{13} - .001 X_{14} \\
 & \quad (1.66) \quad (2.04) \quad (1.28) \quad (2.09) \quad (.001) \\
 & + 1.11 X_{15} - 1.88 X_{16} \quad R^2 = .398 \\
 & \quad (1.30) \quad (1.32)
 \end{aligned}$$

The asterisks denote significance at the 5-percent level. Standard errors are shown in parentheses. The sample size was 75.

The coefficient of multiple determination ( $R^2$ ) means that these variables explained about 40 percent of the variation in DGMs in the sample markets.

For all variables except  $X_{14}$ , the b values show the algebraic additions to the intercept value of 22.96. The only variable that significantly affected the DGMs was state control. None of the labor-union restrictions significantly affected the DGMs, according to this analysis.

Separate regressions were run for markets of different sizes. The model for these regressions was:  $Y = a + bX$ , where  $Y$  equals the DGM in cents per half-gallon,  $a$  is the intercept, and  $X$  is the dummy variable representing the restriction level on innovations and for the other institutional factors.

The variables used were:

$X_1 = 1$  if the market was under state control of retail price; 0, otherwise.

$X_2 = 1$  if store-dock delivery was fully restricted; 0, otherwise.

$X_3 = 1$  if reduced wholesale delivery was fully restricted; 0, otherwise.

$X_4 = 1$  if hourly pay for wholesale drivers was fully restricted; 0, otherwise.

$X_5 = 1$  if no dairy stores were in the market; 0, otherwise.

$X_6 = 1$  if no supermarket captive-plant operations were in the market; 0, otherwise.

The results were as follows:

Small markets ( $n = 29$ )  $R^2 = .50$

$$Y = 22.13 + 5.14 X_1^* + 1.99 X_2 + 2.19 X_4 + 5.79 X_5^* - 1.69 X_6$$

(2.02)      (1.96)      (1.78)      (1.76)      (1.49)

Medium-size markets ( $n = 25$ )  $R^2 = .14$

$$Y = 22.24 + 3.85 X_1 + 2.37 X_2 - 2.61 X_3 + 1.08 X_4 + 1.27 X_5 - 1.09 X_6$$

(3.58)      (3.20)      (6.40)      (2.74)      (2.47)      (3.00)

Large markets ( $n = 21$ )  $R^2 = .23$

$$Y = 22.72 + 3.33 X_1 - 2.47 X_2 - 2.56 X_3 + .52 X_4 + .61 X_5 - .58 X_6$$

(3.58)      (4.38)      (5.45)      (3.18)      (3.46)      (3.71)

*Small* = less than 150 million pounds of milk in 1965; *medium*, 150 to 350 million; *large*, over 350 million pounds. The list of 75 markets, grouped into the three size categories indicated, is given in the Appendix. The asterisks denote significance at the 5-percent level. Standard errors are shown in parentheses.

The coefficient of multiple determination  $R^2$  in the small markets was 0.50. The significant variables were state control and dairy stores. For

large- and medium-size markets, little explanatory capability was found.

In order to gain further insight, the previous model was used in a stepwise correlation program. In this program, the variable is added that makes the greatest improvement in the goodness of fit or that reduces the variance of the dependent variable by the greatest amount [49]. The analysis showed that although state control, hourly pay, and store-dock delivery were of the greatest relative importance, the only statistically significant variable was state control.

It is not surprising that some of the variables were not significant. Dock pickup and warehouse delivery were used for only 8.3 and 2 percent, respectively, of the actual market volumes in unionized markets without restrictions on such use (Table 2).

While the zero-one dummy variable technique used in this analysis offers a way of handling qualitative variables and is valid [50], it does not provide as complete an analysis as would be the case if the variables were quantifiable and continuous.

Bartlett has shown that the entry of dairy stores into the Boston market was accompanied by a drop in the average DGM of 4.7 cents per quart [51]. In Providence, the drop in the average DGM from 1960 to 1962 was 5.3 cents per quart [52]. Pricing policies of dairy stores differ. They can range from "charge the lowest prices in town" (below supermarket prices) to "we will not be oversold" (above supermarket prices).

In a study of ten markets in 1969, Bartlett found the highest delivery labor costs per unit to be 1.636 cents per quart; and the lowest, 0.719 cents [53]. This spread was 0.917 cents per quart; whereas, the DGM in the present study ranged from 6.3 to 19.4 cents per quart. Since cost increases due to restrictions on innovations would be only a fraction of the total labor costs of delivery, these changes could easily be masked by the variance in distributor gross margins.

A detailed study of benefits from innovations in retail home delivery has shown a savings of 1.3 cents per quart by reducing the frequency of retail delivery from three to two times per customer per week [54]. Although these studies were made in markets under state control, they indicate that the benefits of innovations are relatively small in comparison to the figures for the DGM found ordinarily. In addition, the percentage of milk delivered on home-delivery routes is small, so it may not be surprising to find that the level of restriction did not significantly influence DGMs in these models.

Restrictions on innovations were expected to have a significant influence on the unit costs of distribution. To affect DGMs, however, the benefits of having no restrictions on certain innovations must be passed



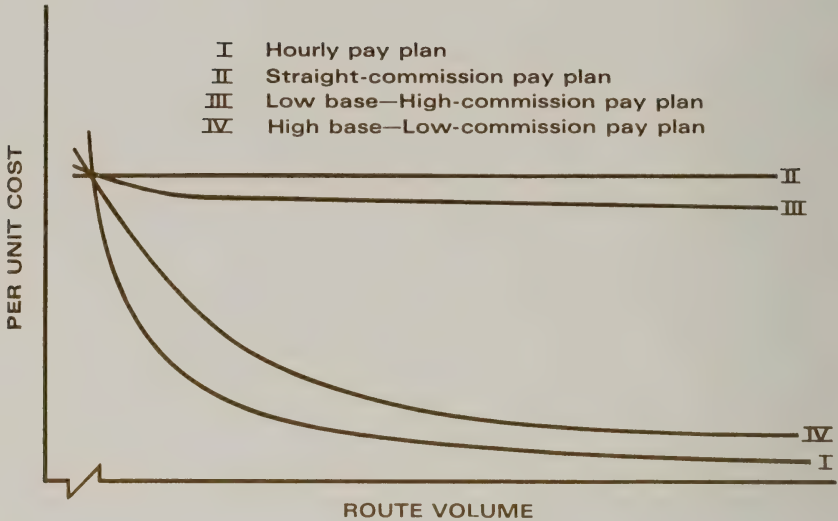
on to the consumers, or back to producers, or both. The market structure and business practices of the fluid-milk processing industry and the actions of the food retailer groups will in large part determine whether such cost savings are passed on to consumers. If the unions agree to relax restrictions in labor-union contracts, the benefits from such action may not be passed on to consumers by fluid-milk processors or retail food stores. If not, these firms may simply increase their own margins or profits. Changes in labor-union contracts may offer an opportunity to reduce the DGM, but it may occur only in markets where competition is keen at both the milk-distributor and retail-food-store levels. Analyzing the structure of these markets was beyond the scope of this study. With the DGM as the dependent variable, specification of the regression models would probably be improved by including the structure of the fluid-milk and food-retailing industries. Such additional specification is left for future research.

Previous research indicates considerable concern over union restrictions on management-desired innovations in fluid-milk delivery. Welsh and Marion state that unions have not changed their policies to keep up with the changing distribution patterns in the dairy industry [55]. "Commission rates are another concern [and] . . . are outdated and unrealistic, especially when considering the requirements of the job" [56]. They go on to say that unions want to continue distribution practices that are obsolete from management's viewpoint. Unions are not modifying present-day contracts for current conditions in the industry; labor is too rigid in its position [57]. Fallert reported that union contracts hampered flexibility in the wholesale delivery system, and concluded that some food retailers may have integrated into fluid-milk processing in order to gain both flexibility and economy in the delivery of fluid milk [58].

### *Analysis of Delivery Labor Costs Per Unit*

The purpose of this part of the analysis is to determine the relationship of union restrictiveness to the costs of delivery labor per unit.

Using the contract provisions in twelve markets for which contracts were available and for which additional information could be determined, driver labor costs were analyzed in relation to restrictions on delivery innovations. All were selected from states without state control of retail prices, since this institutional factor has been shown to exert significant effects on market structure and performance. The analysis was confined to wholesale delivery because of the generally low restriction levels on retail innovations and the relatively low importance of retail deliveries in terms of volume.



Hypothetical delivery-labor cost functions, relating costs per unit to route volume. The level of the curves depends on the size of the base pay and the rate of commission. (Fig. 2)

The labor agreement provisions used were those of mid-1969. Route volume levels were obtained from union and processor personnel through interviews and by questionnaires in 1970 and 1971.

Hourly pay plans, under which all pay depends on the number of hours worked rather than on the volume handled, have a unit cost function that slopes down and to the right (curve I, Figure 2). It is a steep curve, a rectangular hyperbola, since it is theoretically a constant amount of pay per unit of time, divided by increasing amounts of products handled. At the other extreme is the straight-commission-pay plan, under which the costs per unit are constant (curve II, Figure 2).

Lying between these extremes are the cost functions derived from base-plus-commission pay plans. The actual position under this type of pay plan depends on the relative proportion of base and of commission. A low-base plan (curve III, Figure 2) tends to approach the slope of the straight-commission-pay plan. A high-base plan (curve IV, Figure 2) tends to approach the slope of the hourly pay plan. A decreasing-rate commission plan would show a larger decrease to the right than an increasing-rate commission plan, but the decrease would be affected by the proportion of fixed elements in the total plan.

An analysis of twenty-five contracts using commissions in some form showed eighteen used fixed commission rates; two, base plus increas-

ing-rate commissions; and five, decreasing-rate commissions. In all cases, unit costs decreased as volume increased. This was due to the presence of fixed items, either in the base pay or as part of the fringe benefits. The markets using increasing-rate commissions were larger-than-average ones; those with decreasing-rate commissions were smaller than average; and those using fixed-rate commissions were slightly larger-than-average in market size.

The volume of milk delivered per route is a primary determinant of unit costs of delivery on milk routes. In the following analysis, the cost function is defined by the union-contract pay provisions; the volume references are market averages obtained in this study as a basis for determining at what point(s) on the cost function delivery was actually made.

A comparison of the unit cost of constant levels of 3,500 and 7,500 points per day provides a basis for comparing differences in unit costs among markets (Table 16).

Table 17 shows actual route volumes, permitting a determination of the overall cost levels in relation to the levels of restriction on three delivery innovations: store-dock delivery, reduced wholesale delivery, and hourly pay plans. These innovations were selected because of their importance on the basis of this study. Table 17 indicates the level of restriction. Code 1 means no restriction; code 4, the innovation was restricted and could not be used.

**Table 16. — Per Unit Costs of Delivery Labor for Route Volumes of 3,500 and 7,500 Points<sup>a</sup> Per Day, Based on Contract Pay Provisions, 12 Unionized Markets, 1969-1971**

Market	Daily route volume		Type of pay plan
	3,500	7,500	
	<i>cents per quart<sup>b</sup></i>		
Chicago.....	1.75	1.36	Base plus increasing-rate commission
Des Moines.....	1.57	1.28	Straight commission, decreasing rate
Minneapolis.....	1.49	... <sup>c</sup>	Base plus fixed-rate commission
Cincinnati.....	1.46	.81	Base plus decreasing-rate commission
Cleveland.....	1.41	.81	Base plus decreasing-rate commission
Duluth.....	1.35	... <sup>c</sup>	Base plus fixed-rate commission
New York.....	1.34	.80	Base plus fixed-rate commission
Wash., D.C.....	1.26	.87	Base plus fixed-rate commission
St. Louis.....	1.26	.59	Hourly rates
Seattle.....	1.23	.58	Hourly rates
Louisville.....	1.08	.50	Hourly rates (commission optional)
Kansas City.....	1.07	.50	Hourly rates

<sup>a</sup> Quart equivalents as defined in each market. <sup>b</sup> Calculations shown include base, commission, and negotiated fringe benefits such as pension, welfare, and severance pay contributions by employers, plus three weeks' vacation and paid holidays listed in the contract, but does not include statutory fringes such as state and federal employment compensation, social security, etc. <sup>c</sup> Union contract prohibits daily route volumes above 3,500 points.



Table 17. — Index of Unit Costs at Various Route Volume Levels and Levels of Restriction, Three Delivery Innovations, 12 Unionized Markets, 1969-1971

Market and type of route	Actual route volume levels	Actual costs per unit	Index of unit costs <sup>b</sup>	Restriction codes <sup>a</sup>		
				Dock del.	Re- duced del.	Hourly pay plan
<b>Chicago</b>	<i>points</i>	<i>cents per point</i>				
"Ma and pa" stores.....	2,000	2.30	131	4	4	4
"Most" stores <sup>c</sup> .....	4,150	1.64	94			
Supermarkets.....	7,500	1.36	78			
"Captive plants" <sup>d</sup> .....	11,000	1.25	71			
<b>New York</b>						
"Most" stores.....	2,411	1.79	134	4	4	4
"Best" routes <sup>e</sup> .....	3,560	1.34	100			
Supermarkets.....	7,929	.77	57			
<b>Minneapolis</b>						
Market average <sup>f</sup> .....	2,741	1.54	103	4	4	4
<b>Washington, D.C.</b>						
"Captive plants".....	6,300	.94	75	4	4	4
<b>Des Moines</b>						
"Most" stores.....	4,205	1.48	94	4	3	4
Supermarkets.....	14,000	1.17	75			
<b>Duluth</b>						
Market limit <sup>g</sup> .....	3,500	1.35	100	4	1	4
<b>Cincinnati</b>						
"Most" stores.....	2,100	2.17	149	4	1	4
Supermarkets.....	7,000	.86	59			
<b>Seattle</b>						
"Most" stores.....	5,000	.86	70	4	1	1
Supermarkets.....	8,000	.54	44			
<b>Cleveland</b>						
Market average.....	4,120	1.26	89	1	1	4
<b>Louisville</b>						
Market average.....	5,400	.70	65	1	1	1
<b>St. Louis</b>						
Market average.....	5,800	.76	60	1	1	1
<b>Kansas City</b>						
Market average.....	6,000	.62	58	1	1	1

<sup>a</sup> Codes: 4 equals full restriction; 3, partial restriction; 1, no restriction. The first number is the restriction code on store-dock delivery; the second number, reduced delivery; the third number, hourly pay plans for drivers. <sup>b</sup> Each individual cost is divided by the cost at the 3,500-point level for each market, as shown in Table 16. For example, the cost per unit of 2.3 cents at the 2,000-point level is 131 percent of the 3,500-point cost of 1.75 cents in Chicago. A per-unit cost of 1.36 cents at the 7,500-point level is only 78 percent of 1.75 cents. <sup>c</sup> Modal type of store, as defined by the person giving the estimate. <sup>d</sup> Self-owned routes of supermarket chains or other fully integrated operations. <sup>e</sup> "Best performance" routes, as used by the Cornell Dairy Management Information Service. <sup>f</sup> Overall market average, as estimated by the person giving the data.

<sup>g</sup> Route size limited by union contract.

To provide additional information on the relationship of route volume to unit costs, the actual unit cost for each market was divided by the unit cost at the level of 3,500 points per day to provide an index of performance for each market. The index is relative to each market's individual cost for the level of 3,500 points per day. For example, in Chicago the unit cost at 2.3 cents per point for routes covering "ma and pa" store routes was 131 percent of the 3,500-point level, showing delivery on these routes to be relatively costly. On the supermarket routes where volume averaged 7,500 points per route a day, the unit cost of 1.36 was only 78 percent of the 3,500-point level of 1.75 cents.

Table 17 shows that the markets with low restriction on innovations (1-1-1) had relatively lower unit costs and lower indexes than those with higher restrictions. The index of unit costs for Kansas City was 58, with an average route volume of 6,000 points; while the index of unit costs for supermarket routes in Chicago was 78, with an average route size of 7,500 points. The smaller index in Kansas City is due to the lower level of restriction in that market.

Not only are the wage costs lower in a market with fewer restrictions, but the unit cost also decreases faster as the route volume increases. In highly restricted markets with captive plants, even the larger-volume routes (potentially, those with the lowest unit cost) showed higher indexes than the all-route average for markets with a low level of restriction.

This evidence supports the hypothesis that union restrictions on innovative techniques in milk delivery increase distribution costs.

In spite of contractual restrictions on innovations, efficient delivery is possible. The changing structure in the food-retailing industry and associated factors brought about relatively low-cost delivery, even when restrictions were strong. This is demonstrated by the relatively low unit costs for some captive-plant and supermarket routes, compared to other types of routes in these same markets (Table 17). Even though the volume per route is high in markets such as Chicago, Washington, Des Moines, and Cincinnati, the unit costs there are considerably above those in low-restriction markets with lower-volume routes.

In some cases, there were practices that, in effect, circumvented the contractual restrictions. For example, in one market with strong restrictions on less-than-full service by the driver at the stores, the drivers were for practical purposes making store-drop deliveries, because the processors arranged with their customers for the dairy cases to be well-stocked at the time the dairy driver was to make his deliveries. In such cases, there was little for the driver to do in the dairy case, and he found the stop to be largely a drop shipment into the cooler. This enabled faster

service while also honoring the contractual provisions that the driver would service the dairy case as necessary before dropping the balance of the shipment into the cooler.

The interdependence of the three innovations treated in Table 17 is important in assessing their relationship to efficiency and performance. Using store-dock delivery and reduced frequency of delivery increases the driver's output, especially if gate-lifts, dollies, or other mechanical devices are employed. The reduction in unit costs to processors is greater if the drivers are operating under an hourly pay contract, versus a commission plan.

A significant finding of this study is that in markets with no restrictions, the unit delivery costs were lower for the entire market than on supermarket or captive-plant routes where there were restrictions on the three innovations shown in Table 17.

#### DISTRIBUTION OF BENEFITS FROM IMPROVED PERFORMANCE

In most markets, the fluid-milk processors and food retailers operate as oligopolies with a fringe of smaller competitors, particularly in the larger markets. Under these conditions, cost savings from innovations may or may not be passed along in the "marketing chain" to consumers. For example, cost savings may be retained in the form of higher profits for fluid-milk dealers, or supermarkets, or both. In the case of an integrated firm, the fluid-milk plant operation(s) may be just large enough to serve the retail outlets. In one major market, a large integrator reported that his volume capacity was built for projected retail outlet demand, with no intention of using custom processing as a means of expanding market share or increasing plant usage. In such a case, the management may have little incentive to decrease prices in order to expand volume in terms of market share, unless milk were being used as a loss leader to attract trade.

Cumberland Farms Dairy is an example of an integrated enterprise that has passed along cost savings obtained through a large-volume, low-cost operation. Bartlett reported significant decreases in the DGM when Cumberland entered the Providence and Boston markets [59, 60]. The economic importance of this kind of operation has been treated in some detail in a study of fluid-milk price wars [61].

In an integrated operation such as the one outlined in the second preceding paragraph, the benefit of improved efficiency would be captured largely by the innovating firm; in the second case (Cumberland Farms Dairy), the consumer would tend to realize at least a portion of the benefits. One large, integrated enterprise with convenience stores in Ohio



reported that it would "not be oversold" on milk prices. In that case, a highly efficient processing and distribution operation did not result in lowered prices to consumers.

Processors in a market may adopt a "live and let live" pattern, so that the DGM remains relatively fixed in spite of the adoption of innovations permitted by the union. Under these conditions, a firm that is more efficient or innovative than others may realize higher net profits.

The assumption that lower prices to consumers result from low-cost delivery methods presumes that savings are passed on. "Low cost" is assumed to reflect real efficiencies, and not loss-leader pricing.

### SUMMARY AND CONCLUSION

Collective bargaining in the fluid-milk industry is a widespread and well-developed institution. In 1969-1971, four-fifths of the fluid-milk volume packaged and delivered at the wholesale level was handled by unionized workers. Unionization tends to be more prominent in the larger plants than in the smaller ones.

The largest share of the industry is organized by Teamster Locals — although there are several other affiliations for dairy locals, plus some independent local unions. The Teamster organization is adjusting to some of the changing conditions in the industry by expanding area bargaining at the Teamster Conference level. This is intended to improve labor's bargaining position while keeping pace with the declining number and increasing size of processing plants. Conference-level bargaining uses Master Agreements to cover the major items common to the area and puts bargaining on the union side at a higher echelon, more in keeping with the bargaining power of the larger processors. This adjustment may slow down innovation in some markets if the union can, through this device, continue to prevent the initiation of new practices.

Innovations are treated differently in various markets. An individual innovation may be: (1) strongly opposed, and thus restricted by the local union; (2) permitted, but only under contract provisions designed to protect worker or union interests; (3) permitted by the union, but not adopted by processors; (4) unrestricted by the union and used in the market. Even in nonunion markets, the innovations studied were not universally adopted.

Some innovations appear to have differing levels of applicability in different markets. For example, warehouse delivery is not feasible for stores that do not belong to a chain of some sort. Also, warehouse receipt and distribution of milk may be undesirable for many chains, especially if their stores are large and are in concentrated areas where large-

volume milk delivery from processors can serve them more efficiently than they could serve themselves through deliveries from their own warehouse facilities.

Some innovations may lend themselves only to certain types of routes. Hourly pay for wholesale deliveries, for example, could be an important innovation for a processor on his large-delivery, suburban routes, but not on his small, full-service routes. Store-dock delivery might be well suited to supermarket routes, but not to those serving small neighborhood stores or other small-volume customers.

Institutional factors, such as state control of retail prices, may help set market patterns that affect innovations. For example, under Pennsylvania conditions, the typical wholesale pattern is far different from that of typical Midwestern markets not under state control. Interviews with milk processors indicated that in the Midwestern markets, the delivery of 500 to 800 quarts per day per store by one or two suppliers was common. On the other hand, research in Pennsylvania markets revealed that many stores receive 15 quarts or less per delivery from four or more suppliers, and that savings of 4 to 6 cents a quart would be possible by having two suppliers deliver every other day [62]. Thus, the resale pricing structure in most Pennsylvania markets seemed to provide no economic incentive for resale outlets to accept less-frequent deliveries [63].

In one state-controlled market, dock pickup was not used, although not restricted by the union, because the state control provisions required milk to be transferred from processor to resale customer at the same price, whether the milk is delivered by the dairy driver or picked up at the plant dock by the wholesale customer. Under such institutional constraints, dock pickup has not been used, and is not likely to be.

Union restrictions may not explicitly prevent the use of innovations, yet may effectively remove the economic incentive to use certain ones. For example, a Duluth union provision requires all of the market area to be assigned to one driver or another on a territorial basis. Dock pickup was explicitly permitted; but for all quantities so handled, the driver in whose territory the customer was located would receive the same commission as if he had actually made the delivery. This effectively removes much of the economic incentive to use dock pickup, and discourages the widespread use of this innovation.

Differences between markets in the degree of restriction placed by the local union on certain innovations come about in part from the high degree of autonomy of the Teamster Local. As an example, the two dairy Teamster Locals in Chicago apparently have little to do with the Central Conference of Teamsters, thus operating independently of it.

The Minneapolis Dairy Local continues to impose its 3,500-point daily limit on wholesale drivers, even though the Central Conference of Teamsters — with which it is closely associated — does not use this type of provision in its negotiations.

Large unions in the larger markets are more powerful and more capable of restricting undesired innovations than smaller ones in the smaller markets, as the analysis in this study shows. This study also shows that a reduction of wholesale delivery to five or fewer days a week was the most widely adopted innovation, when its use was permitted by the unions. Reducing retail delivery to two deliveries or less per customer per week and using hourly pay for wholesale drivers were the next most-widely adopted innovations in the markets studied where unions permitted such use. The least-used innovations were warehouse delivery and dock pickup, both of which lend themselves primarily to the operational patterns in large markets.

Geographically, there were noticeable differences in the use of certain innovations. In the western area, hourly pay for wholesale drivers was very common; in the eastern area, its use was restricted. Perhaps the difference in population density is one of the factors affecting the attitude of the unions about this innovation. Reduced wholesale delivery was also widely permitted in the western area, while strongly restricted in the eastern area.

On the other hand, innovations that obviously reduced driver labor, such as dock pickup, warehouse delivery, store-dock delivery, and subcontracting through vendors, were highly restricted in the western area, but permitted to a larger extent in others.

In relating the restrictiveness of innovations to the distributor gross margin (DGM), no significant statistical relationship could be established between the use of innovations and those margins. Other institutional factors were also included in the analysis; but of these, the only one significantly affecting DGMs was state control of retail milk prices.

Restrictions on delivery innovations were found to affect unit costs of delivery, even though the DGMs were not significantly affected by different levels of restrictiveness. Unit costs of delivery varied with the size of the route, as defined by the contract pay provisions. Unit costs decreased rapidly as route volume increased in markets that permitted hourly pay contracts. This analysis supports the idea that the performance of the market, as measured by unit costs of delivery, is better in those with few or no restrictions on innovations.

A major finding of this study was that cost savings from low levels of restriction on innovations may or may not be passed on to consumers



in lower retail prices. Depending on the competitive conditions and business practices of the firms in the market, cost savings may be retained as larger profits by fluid-milk processing firms or food retailers, or both.

Some union contracts permit innovation, as long as drivers receive higher rates of pay under the innovation, thus capturing a part of the benefit for drivers. This portion, of course, is not available to the processor to pass on within the marketing structure. In such cases, low restrictions on innovations would not be associated with low DGMs, since part or all of the cost savings would not be realized by the processor and thus could not be passed along to the consumer.

In this study, costs per unit were also found to be affected by the type of outlet served. In general, smaller stores were served by smaller routes, making unit costs higher than for supermarkets and other large-scale, integrated operations.

Bartlett and Gruebele found that the introduction of low-cost dairy stores affected the DGMs over time in several markets [64, 65]. One reason why the influence of innovations might not have been detected as distinctly in this study as in Bartlett's analysis of the entrance of dairy stores could be that the cost savings were added to the profits of firms, rather than being passed on to consumers. A second reason might be that the changes in the contractual provisions took place over a longer time.

In making changes that would reduce the number of drivers, the unions often insisted that no driver should lose his job because certain restrictions were relaxed. The rate of adoption between firms and across the entire market was geared to the attrition rate of drivers. In one market, these changes were made at a time when the driver age structure apparently was favorable to a high rate of retirement and other driver turnover. Even so, there were still variations of several months to two years among firms in completing the transition.<sup>4</sup>

Even where there were no restrictions, many innovations were not used, both in nonunion and in union markets. This indicates that innovations cannot be considered as cost-reducing ones for all firms or under all market conditions.

When worker interests can be protected and an innovation is actually cost-reducing, it is desirable as a matter of public policy and welfare for such an innovation to be employed. "Welfare," in a Paretian sense,<sup>5</sup>

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<sup>4</sup>Information obtained during personal interviews with union officials.

<sup>5</sup>The reference is to Vilfredo Pareto. The Pareto criterion is: "Any change which harms no one and which makes some people better off (in their own estimation) must be considered to be an improvement." [Baumol, W.J. 1961. *Economic Theory and Operations Analysis*. Englewood Cliffs, N.J. Prentice-Hall. P. 267.]



may be reduced if union restriction on innovation results in lower market performance that damages the interests of other market participants, such as consumers or producers.

If producers and/or consumers are to share the benefits of innovations being adopted, the processors must realize a benefit in the form of cost savings and must pass along some part of this benefit. That portion of the cost savings captured by the drivers as higher earnings cannot be passed on. If consumers are to receive any portion of the benefit, processors must be disposed to pass benefits forward, in whole or in part, and food retailers, in turn, must also pass a portion or all of the cost savings on in the form of lower prices.

A significant question is whether policy decisions that would force a relaxation of union restrictions should be imposed on the dairy industry. In the fluid-milk business, as a part of private industry, the expressed national labor policy is to allow wages, hours, and other terms and conditions of employment to be set through collective bargaining between workers and management. This freedom to match bargaining power between processors and their employees should remain until greater harm comes to other market participants than the good effects accruing to milk drivers. Measuring these concepts is very difficult, and is beyond the scope of this study.

Forces for change resulting from rapid advances in milk processing and delivery technology may be strong enough to force improved efficiency without the imposition of public policy actions. While these forces will have to work through the institution of collective bargaining, union officials have expressed to the authors a recognition of union overrestrictiveness in some markets.

A relaxation of certain restrictive contractual provisions, some of which have been in use for decades in various markets, seems likely because of: (1) major changes in fluid-milk retailing practices; (2) new advances in processing, refrigeration, and transportation; (3) the growth of vertical integration; (4) an expansion of bargaining between producer cooperatives and milk dealers; (5) mergers of federal marketing orders; and (6) greater understanding about labor matters. For example, the load limits on the daily output of wholesale drivers as used in three markets in this study may be completely obsolete for current trucks, handling equipment, freeways, and wholesale customer facilities and practices. Some long-used forms of commission pay for wholesale drivers delivering 8,000 to 10,000 quarts per day with mechanized equipment, either to a warehouse or to the supermarket dock, may now be obsolete, compared to the conditions that existed when the provisions

were written into labor-union contracts. Drivers carried out many sales, handling, and bookkeeping functions which they no longer perform.

Modernizing contractual provisions may help improve overall marketing efficiency to the benefit of all or most market participants in the industry. Sleight has previously suggested that improvements in contracts can increase the efficiency of the system without harming driver interests, by permitting innovations but at the same time preventing the full, human cost of such changes from being borne by the drivers [66]. Sleight and Gruebele have given a sample analysis showing simultaneous consideration of innovative efficiency and driver welfare [67].

#### LITERATURE CITED

1. Mortenson, W.P. 1940. Milk distribution as a public utility. Univ. Chicago Press. P. 189.
2. Spencer, L. 1943. Costs of distributing milk in New Jersey. New Jersey Dept. Agr. P. 22.
3. Herrmann, L.F., and T.J. Whatley. 1950. Costs and margins of milk distributors in Memphis, Tennessee in 1948. U.S. Dept. Agr. Bur. Agr. Econ. (in coop. with Tenn. Agr. Exp. Sta.). P. 5.
4. Allred, W.M., and E.H. Ward. 1953. Costs, quality, and prices of fluid milk in rural and urban areas of Utah and Montana. Utah Agr. Exp. Sta. Bull. 365. P. 3.
5. MacPherson, D.D. 1962. Milk distributors' operations. U.S. Dept. Agr., Econ. Res. Serv. ERS-84. P. 26.
6. Williams, S.W. 1953. Costs and returns to Alabama milk distributors. Ala. Exp. Sta. Bull. 287. P. 14.
7. MacPherson, p. 27.
8. Rees, A. 1962. The economics of trade unions. Univ. Chicago Press. P. 25.
9. Bartlett, R.W. 1946. The milk industry. Ronald Press, New York City. P. 70.
10. Romer, S. 1962. The International Brotherhood of Teamsters: Its government and structure. John Wiley & Sons, New York City. Pp. 97-98.
11. Bartlett, R.W. 1970. An economic analysis of wage contracts of wholesale milk drivers as related to efficiency in milk distribution. Dairy Marketing Facts. Univ. Ill. Dept. Agr. Econ. AE-4230. P. 3.
12. Romer, p. 84.
13. Romer, p. 89.
14. Central Conference of Teamsters, Detroit. 1959. New gains in eliminating area wage differentials. 1959 Chairman's Rpt.
15. Romer, p. 90.
16. Romer, p. 91.
17. Romer, p. 92.
18. Dairy Employees Union, Local 754, Chicago. 1969. Fluid milk contract (May 1, 1969 to May 1, 1971). Art. 18.

19. Raunika, R., J.C. Purcell, and J.C. Elrod. 1969. Spatial and temporal aspects of the demand for food in the United States. I. Fluid milk. Ga. Agr. Exp. Sta. Res. Bull. 61.
20. Milk Drivers and Dairy Employees Union, Local 207, Kansas City, Mo. 1967. Local addendum, 1967-70. P. 17.
21. Cook, H.L., H.W. Halvorson, and R.W. Robinson. 1956. Costs and efficiency of wholesale milk distribution in Milwaukee. Wis. Agr. Exp. Sta. Res. Bull. 196. P. 26.
22. Goodwin, J.D., J.C. Purcell, and J.C. Elrod. 1969. Analysis of factors affecting time requirements for distributing milk on wholesale and retail routes in Georgia. Ga. Agr. Exp. Sta. Res. Bull. 52.
23. Dairy Record. 1970. 71(2) :10.
24. Dairy Record. 1970. 71(4) :10.
25. Clarke, J.N., A.L. Haight, and C.N. Shaw. 1966. Twice-weekly milk delivery : Experience, opinion, and economic effects. W. Va. Agr. Exp. Sta. Bull. 525T. Pp. 50-51.
26. Gruebele, J.W., S.W. Williams, and R.F. Fallert. 1970. Impact of food chain procurement policies in the fluid milk industry. Amer. Jour. Agr. Econ. 52(3) : 395-403.
27. U.S. Department of Labor. 1974. Handbook of labor statistics, 1973. P. 15.
28. Bureau of Labor Statistics. 1970. Union wages and hours, local truck drivers and helpers, July 1, 1969. U.S. Dept. Labor Bull. 1669. Pp. 8-40.
29. Manchester, A.C. 1971. Pricing milk and dairy products: Principles, practices, and problems. Agr. Econ. Rpt. 207. U.S. Dept. Agr., Econ. Res. Serv. P. 11.
30. Jarrett, W.A., and C.E. French. 1962. Changes in ownership of Indiana fluid milk plants, 1946-1955. Ind. Agr. Exp. Sta. Res. Bull. 745. Pp. 1-20.
31. Bartlett, 1970, p. 3.
32. American Dairy Review. Aug., 1970. Late news briefs. P. 75.
33. Business Week. Oct. 15, 1960. In labor. P. 167.
34. Bureau of Labor Statistics. 1973. Union wages and hours, local truck drivers and helpers, July 1, 1972. U.S. Dept. Labor Bull. 1802. Pp. 8-40.
35. U.S. Department of Agriculture. 1971. Packaged fluid milk sales in federal order markets. Consumer and Mktg. Serv., Dairy Div. C&MS-11 (for Nov., 1969). Pp. 35-37.
36. Brewer, T.A. 1969. Centralization of union-management bargaining and its relationship to performance in the Chicago, Detroit, and Buffalo fluid milk markets. Cornell Univ. Dept. Agr. Econ. Ph.D. thesis. P. 78.
37. Bain, J.S. 1959. Industrial organization. John Wiley & Sons, New York City. P. 411.
38. Bartlett, R.W. 1965. Milk distribution margins, prices, and consumption : State controlled versus competitive markets. Ill. Agr. Econ. 5(2) :20.
39. Yamane, T. 1964. Statistics: An introductory analysis. (2nd ed.) Harper and Row, New York City. P. 467.
40. Bartlett, R.W. 1969. Can fluid milk prices compete with the prices of filled and imitation milk? Dairy Marketing Facts. Univ. Ill. Dept. Agr. Econ. AE-4201. Pp. 1-9.
41. Gruebele, J.W. 1969. Vertical integration in the processing and distribution of milk. Dairy Marketing Facts. Univ. Ill. Dept. Agr. Econ. AE-4225. Pp. 1-6.
42. Bartlett, 1965, Ill. Agr. Econ., p. 24.
43. Gruebele, J.W. 1971. Increasing efficiency in the distribution of milk through vertical integration. Dairy Marketing Facts. Univ. Ill. Dept. Agr. Econ. AE-4272. Pp. 1-9.
44. National Commission on Food Marketing. 1966. Organization and competition in food retailing. The commission, Wash., D.C. Tech. Study 1. P. 90.

45. Manchester, p. 13.
46. Bartlett, R.W. 1965. Is state control of consumer milk prices in the public interest? Ill. Agr. Exp. Sta. Bull. 705.
47. Bartlett, 1965, Ill. Agr. Econ.
48. Bartlett, 1969.
49. Department of Computer Science, University of Illinois at Urbana-Champaign. 1971. SOUPAC program description. Rpt. 370-3. P. E-7.
50. Tomek, W.G. 1963. Using zero-one variables with time series data in regression equations. Amer. Jour. Farm Econ. 145(4) :814-822.
51. Bartlett, 1965, Bull. 705, p. 15.
52. Bartlett, 1965, Ill. Agr. Econ., p. 24.
53. Bartlett, 1965, Ill. Agr. Econ. p. 8.
54. Clarke *et al.*, p. 51.
55. Welsh, R.S., and B.W. Marion. 1965. Management-labor relations in agricultural marketing industries. Ohio Coop. Ext. Serv. and Dept. Agr. Econ. and Rural Soc. P. 129.
56. *Ibid.*
57. *Ibid.*, pp. 131-134.
58. Fallert, R.F. 1971. An analysis of buyer-seller relations between food chains and fluid milk processors in the North Central Region. Purdue Univ. Dept. Agr. Econ. Ph.D. thesis. P. 189.
59. Bartlett, 1965, Bull. 705, p. 15.
60. Bartlett, 1965, Ill. Agr. Econ., p. 24.
61. Harris, E.S. 1966. Price wars in city markets. U.S. Dept. Agr., Econ. Res. Serv. Rpt. 100.
62. Barron, J.C., and W.T. Butz. 1965. Distribution of fluid milk through resale outlets. Pa. Agr. Exp. Sta. Bull. 723. P. 31.
63. *Ibid.*
64. Gruebele, 1969, p. 5.
65. Bartlett, 1965, Bull. 705, p. 16.
66. Sleight, L.G. 1971. Can labor efficiency be increased through use of improved labor contracts? Dairy Marketing Facts. Univ. Ill. Dept. Agr. Econ. AE-4288. Pp. 8-12.
67. Sleight, L.G., and J.W. Gruebele. 1974. Compensating the human costs of increased productivity of fluid milk drivers. Amer. Jour. Agr. Econ. 56(3): 594-599.



## APPENDIX

*Northeastern Regional Dairy Marketing Project (NEM-40)*

This survey was made in 1969 by questionnaire, and covered 75 markets in 32 states. The markets were grouped according to the volume of milk handled in 1965; *small*, less than 150 million pounds; *medium*, 150 to 350 million; *large*, over 350 million pounds.

**Small Markets**

Alton, IL	Cheyenne, WY	Johnstown, PA	Montgomery, AL
Augusta, GA	Clarksburg, WV	Las Vegas, NV	Paducah, KY
Battle Creek, MI	Eau Claire, WI	Lexington, KY	Reading, PA
Beloit, WI	Evansville, IN	Madison, WI	Reno, NV
Bismarck, ND	Grand Forks, ND	Marquette, MI	Rock Island, IL
Burlington, VT	Great Falls, MT	Medford, OR	Salem, OR
Butte, MT	Huntington, WV	Mobile, AL	Springfield, IL
	Wheeling, WV		

**Medium-Size Markets**

Akron, OH	Duluth, MN	Louisville, KY	Rockford, IL
Albuquerque, NM	Erie, PA	Memphis, TN	Scranton, PA
Atlanta, GA	Fort Wayne, IN	Omaha, NB	South Bend, IN
Birmingham, AL	Gary, IN	Peoria, IL	Spokane, WA
Charleston, WV	Green Bay, WI	Phoenix, AZ	Springfield, MO
Des Moines, IA	Hartford, CT	Portland, OR	Toledo, OH
	Washington, D.C.		

**Large Markets**

Baltimore, MD	Cleveland, OH	Indianapolis, IN	Newark, NJ
Boston, MA	Columbus, OH	Kansas City, MO	New York, NY
Buffalo, NY	Denver, CO	Miami, FL	Philadelphia, PA
Chicago, IL	Detroit, MI	Milwaukee, WI	Pittsburgh, PA
Cincinnati, OH	Houston, TX	Minneapolis, MN	Seattle, WA
	St. Louis, MO		

Additional information about the NEM-40 survey is available from the authors.

*Appendix Tables 1-4 are given on the following pages.*

**Appendix Table 1.—Complete Restriction for Six Wholesale and Two Retail Delivery Innovations, by Size Group, Number of Markets, and Volume, 75 Unionized Markets, 1969-1971**

Innovation	Group and number of markets <sup>a</sup>			
	Large 21	Medium 25	Small 29	Total 75
	<i>percent of markets</i>			
Dock pickup.....	28.6	40.0	20.7	29.3
Warehouse delivery.....	33.4	40.0	31.0	34.6
Store-dock delivery.....	33.3	24.0	20.7	25.3
Reduced wholesale delivery.....	23.8	4.0	0	8.0
Subcontracted wholesale delivery.....	4.8	16.0	17.2	13.3
Hourly pay, wholesale.....	52.4	28.0	37.9	38.7
Reduced frequency, retail.....	14.3	4.0	24.1	14.7
Subcontracted retail delivery.....	0	16.0	17.2	12.0
	<i>percent of volume</i>			
Dock pickup.....	42.2	39.1	23.2	40.0
Warehouse delivery.....	44.3	40.5	32.3	42.6
Store-dock delivery.....	47.1	21.1	21.0	39.8
Reduced wholesale delivery.....	41.9	2.9	0	30.7
Subcontracted wholesale delivery.....	3.9	15.5	18.3	7.3
Hourly pay, wholesale.....	65.0	27.6	36.9	55.3
Reduced frequency, retail.....	28.3	5.0	27.5	23.6
Subcontracted retail delivery.....	0	15.5	18.3	4.6

<sup>a</sup> Market groupings: *large* equals over 350 million pounds in 1965; *medium*, 150 to 350 million; *small*, less than 150 million.

**Appendix Table 2.—Partial Restrictions for Six Wholesale and Two Retail Delivery Innovations, by Size Group, Number of Markets, and Volume, 75 Unionized Markets, 1969-1971**

Innovation	Group and number of markets <sup>a</sup>			
	Large 21	Medium 25	Small 29	Total 75
	<i>percent of markets</i>			
Dock pickup.....	23.8	16.0	6.9	14.7
Warehouse delivery.....	9.5	0	0	2.7
Store-dock delivery.....	4.8	4.0	3.5	4.0
Reduced wholesale delivery.....	9.5	8.0	6.9	8.0
Subcontracted wholesale delivery.....	28.6	8.0	0	10.7
Hourly pay, wholesale.....	4.8	16.0	6.9	9.3
Reduced frequency, retail.....	9.5	8.0	3.4	6.7
Subcontracted retail delivery.....	9.5	0	0	2.7
	<i>percent of volume</i>			
Dock pickup.....	17.3	14.5	10.1	16.2
Warehouse delivery.....	10.1	0	0	7.3
Store-dock delivery.....	6.0	5.0	2.3	5.5
Reduced wholesale delivery.....	9.7	8.1	10.6	9.5
Subcontracted wholesale delivery.....	31.9	7.3	0	24.4
Hourly pay, wholesale.....	6.2	15.8	7.8	8.3
Reduced frequency, retail.....	6.0	7.6	5.4	6.2
Subcontracted retail delivery.....	20.6	0	0	14.8

<sup>a</sup> Market groupings: *large* equals over 350 million pounds in 1965; *medium*, 150 to 350 million; *small*, less than 150 million.

Appendix Table 3. — Markets Where Innovations Were Not Restricted and Were Not Used, Six Wholesale and Two Retail Delivery Innovations, by Size Group, Number of Markets, and Volume, 1969-1971

Innovation	Group and number of markets <sup>a</sup>			
	Large 21	Medium 25	Small 29	Total 75
	<i>percent of markets</i>			
Dock pickup.....	19.0	8.0	37.9	22.7
Warehouse delivery.....	19.0	16.0	41.4	26.7
Store-dock delivery.....	0	8.0	31.0	14.7
Reduced wholesale delivery.....	0	0	0	0
Subcontracted wholesale delivery.....	23.8	12.0	34.5	24.0
Hourly pay, wholesale.....	0	0	6.9	2.7
Reduced frequency, retail.....	0	12.0	10.4	8.0
Subcontracted retail delivery.....	4.8	4.0	13.8	8.0
	<i>percent of volume</i>			
Dock pickup.....	17.6	7.5	39.6	17.3
Warehouse delivery.....	14.0	13.1	39.1	15.8
Store-dock delivery.....	0	10.1	28.6	4.3
Reduced wholesale delivery.....	0	0	0	0
Subcontracted wholesale delivery.....	25.5	14.1	33.0	23.8
Hourly pay, wholesale.....	0	0	6.6	.5
Reduced frequency, retail.....	0	9.4	9.0	2.6
Subcontracted retail delivery.....	3.6	3.4	12.0	4.2

<sup>a</sup> Market groupings: *large* equals over 350 million pounds in 1965; *medium*, 150 to 350 million; *small*, less than 150 million.

Appendix Table 4. — Markets Where Innovations Were Not Restricted and Were Used for Six Wholesale and Two Retail Delivery Innovations, by Size Group, Number of Markets, and Volume, 1969-1971<sup>a</sup>

Innovation	Group and number of markets <sup>a</sup>			
	Large 21	Medium 25	Small 29	Total 75
	<i>percent of markets</i>			
Dock pickup.....	28.6	36.0	34.5	33.3
Warehouse delivery.....	38.1	44.0	27.6	36.0
Store-dock delivery.....	61.9	64.0	44.8	56.0
Reduced wholesale delivery.....	66.7	88.0	93.9	84.0
Subcontracted wholesale delivery.....	42.8	64.0	48.3	52.0
Hourly pay, wholesale.....	42.8	56.0	48.3	49.3
Reduced frequency, retail.....	76.2	76.0	62.1	70.6
Subcontracted retail delivery.....	85.7	80.0	69.0	77.3
	<i>percent of volume</i>			
Dock pickup.....	22.9	38.9	27.1	26.5
Warehouse delivery.....	31.6	46.4	28.6	34.3
Store-dock delivery.....	46.9	63.8	48.1	50.4
Reduced wholesale delivery.....	48.4	89.0	89.4	59.8
Subcontracted wholesale delivery.....	38.7	63.1	48.7	44.5
Hourly pay, wholesale.....	28.8	56.6	48.7	35.9
Reduced frequency, retail.....	65.7	78.0	58.1	67.6
Subcontracted retail delivery.....	75.8	81.1	69.7	76.4

<sup>a</sup> Market groupings: *large* equals over 350 million pounds in 1965; *medium*, 150 to 350 million; *small*, less than 150 million.







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